DOCUMENT RESUME

ED 068 785 AC 012 900

TITLE	Intermediate Leadership Development. Reserve Officer Training Corps Manual.
INSTITUTION	Department of the Army, Washington, D.C.
REPORT NO	ROTCM-145-4-2
PUB DATE	Feb 72
NOTE	208p.
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	Armed Forces; Colleges; Curriculum Guides; *Leadership Training; Manuals; *Military Personnel; Military Science; *Military Training; *Officer Personnel; *Textbooks
IDENTIFIERS	*Reserve Officers Training Corps

ABSTRACT

"Intermediate Leadership Development" is the subject of this Reserve Officers Training Corps manual which is designed to be used as a textbook. The individual actions which protect a soldier and make him effective in small units are discussed in Part One. Part Two is concerned with techniques of military instruction and provides suggestions for military instructors. Individual and Crew-served weapons and antipersonnel/tank mines are the subjects of Part Three. (For related document, see AC 012 899.) (RS)

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

ED 068785

ROTCM 145-4-2

DEPARTMENT OF THE ARMY ROTC MANUAL

RESERVE OFFICER TRAINING CORPS MANUAL
INTERMEDIATE LEADERSHIP DEVELOPMENT

FILMED FROM BEST AVAILABLE COPY

VT 016 900

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1972

FOREWORD

This manual supports the Junior ROTC MT-2 curriculum entitled "Intermediate Leadership Development."

The proponent of this ROTCM is the United States Army Infantry School. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications) to the Commandant, United States Army Infantry School, ATTN: ATSIN-I-T, Fort Benning, Georgia 31905, with information copy furnished Commanding General, United States Continental Army Command, ATTN: ATIT-R-ED, Fort Monroe, Virginia 23351.

Part one of the manual explains how the individual actions of the soldier are designed to protect him and at the same time make him an effective soldier. This same basic training is also designed to teach the soldier how to become an effective member of a squad of soldiers and fight as a member of a coordinated team.

Part two explains and illustrates the fundamentals of the instruction process which the military has found to be useful. Essentially, these techniques are primary requirements for instruction on any type material.

Part three illustrates various types of primary weapons currently employed. The weapons within each category represent the variety of arms and munitions that have been developed to date and which have proven most effective in both offensive and defensive military tactics.

DOD

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: AC | UT

In our judgement, this document is also of interest to the clearinghouses noted to the right. Indexing should reflect their special points of view.

ROTC MANUAL
No. 145-4-2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *1 February 1972*

INTERMEDIATE LEADERSHIP DEVELOPMENT

		Page
PART ONE.	INDIVIDUAL AND SQUAD ACTIONS RELATIVE TO SMALL UNIT TACTICS	
CHAPTER 1.	COVER AND CONCEALMENT	3
2.	INDIVIDUAL MOVEMENT	10
3.	COMBAT FORMATIONS	23
4.	BATTLE DRILL	33
5.	PATROLLING	46
6.	TECHNIQUE OF FIRE OF THE RIFLE SQUAD	64
7.	TACTICS OF THE RIFLE SQUAD	80
PART TWO.	TECHNIQUES OF MILITARY INSTRUCTION	
CHAPTER 8.	THE INSTRUCTOR	94
9.	PRINCIPLES OF INSTRUCTION	99
10.	PRESENTING ORAL INSTRUCTION	105
11.	SPEECH TECHNIQUES	109
12.	QUESTIONING TECHNIQUES	119
13.	THE DEMONSTRATION	123
14.	TRAINING AIDS	126
15.	APPLICATION	133
16.	PREPARATION FOR INSTRUCTION	141
17.	EVALUATION	148
18.	TRAINING LITERATURE	156
PART THREE.	WEAPONS: INDIVIDUAL, CREW-SERVED, AND ANTIPERSONNEL/TANK MINES	
CHAPTER 19.	INDIVIDUAL WEAPONS	158
20.	CREW SERVED WEAPONS	174
21.	ANTIPERSONNEL/TANK MINES	195

---

*This manual supersedes ROTCM 145-4-2, 1 April 1968.

PART ONE

INDIVIDUAL AND SQUAD ACTIONS RELATIVE TO SMALL UNIT TACTICS

CHAPTER 1

COVER AND CONCEALMENT

GENERAL

Cover is protection from the *fire* of hostile weapons. Ditches and foxholes protect you from flat trajectory fire and partially protect you from high angle fire. A reverse slope protects you from the flat trajectory fire of such weapons as rifles and machineguns but does not fully protect you against the high angle fire of mortars and artillery.

Concealment, either natural or artificial, provides protection from hostile *observation*. Natural concealment is provided by your surroundings and needs no change; for example, bushes and grass. Concealment by artificial means is achieved by use of various materials such as nets, burlap, or paints.

Natural features—ditches, hollows, embankments, and folds in the ground—offer protection from hostile fire (fig. 1). Watch for the slight depressions and humps in the ground and take advantage of all available cover when under enemy fire. If forced to stay in a position where there is not enough cover, dig in.

HOW TO CONCEAL YOURSELF

While carrying out training or battlefield missions, follow these general rules of concealment:

Avoid Unnecessary Movements. Remain motionless—movement attracts attention. You may be perfectly concealed when motionless but easily detected if moving. When changing positions, move carefully over a concealed route to the new position.

Use All Available Concealment. The background is important and the ability to blend into it prevents enemy detection of your position. Trees, bushes, grass, earth, and manmade structures forming a background are different in color and appearance, making it simple to blend with them. Select a tree or bush that blends with your uniform

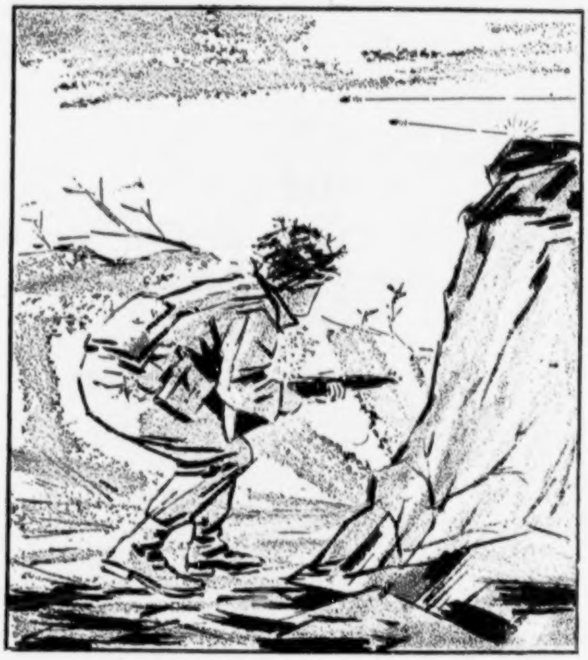


Figure 1. Natural protection from flat trajectory fire.

and absorbs the outline of your figure. Remember that movement against an unmoving background stands out clearly.

Camouflaging the Face, Hands, Uniform, and Equipment. Exposed skin reflects light that can be picked up by an enemy rifleman or observer. Color your face in irregular splotches to eliminate the possibility of reflection (fig. 2). Paint across the nose-line, cheekbones, eyes, and chin line using issue camouflage face paint, lampblack, burnt cork, or mud. However, mud should be used only as a last resort because it washes off easily and may be harmful since some soils may contain toxic bacteria. Do not paint wide straight bands or a regular pattern. Try to break the outline of your face, and mask your eyes and cheekbones. Paint your neck, upper chest, lower arms, and both sides of your hands. Have another man help you put on the camouflage and check it when you are finished.

Artificial Means of Camouflage Include Clothing, Paints, and Nets. Camouflage suits are designed to blend with a wide variety of surroundings. When issue suits are not available, make your own camouflage clothing from the field uniform. Keep the terrain in mind, and make the uniform look like the terrain in color. Make a sack suit from

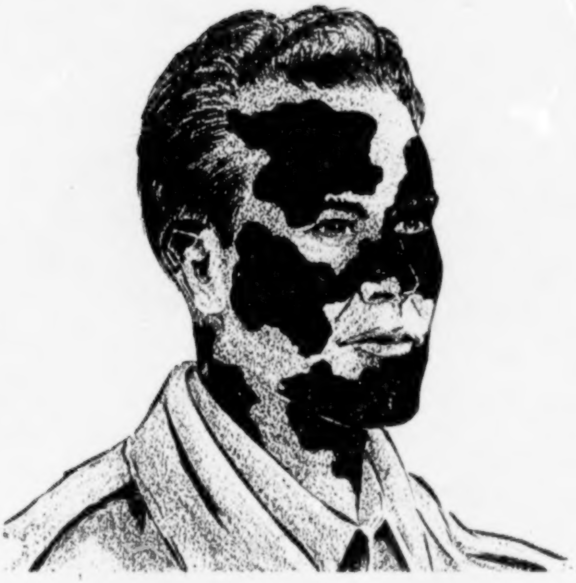


Figure 2. Face camouflaged in splotches

burlap. It should be large and loose to break the outline of your body. Fasten a hood to the shoulder to cover your head. This type suit is colored to blend with any type of background or terrain. For coloring, use dye, paint, or mud, preferably in two or more colors. In sand, use burlap in its natural color; in wooded terrain, use green and black burlap; in brown terrain, dye the natural burlap by boiling it in coffee grounds. You can make a suit for use in snow from a mattress cover or a sheet.

The Color of the Grass, Leaves, and Brush Changes With the Seasons. Whenever necessary, adapt or modify the appearance of equipment to make it blend with the terrain. When using white camouflage, equipment must also be colored white.

The Helmet Has a Distinctive Outline That Must Be Altered. Use paint or mud splotched irregularly on the helmet to disguise and dull the surface (fig. 3). Use a helmet cover improvised from a piece of cloth or burlap and colored to blend with the background. If available, use wire or string tied around the helmet to hold the loose camouflage material in place. Let foliage protrude over the edges of the helmet but do not use too much as it may draw attention.

To Camouflage Your Weapon, Use Mud or Dirt To Dull the Shiny Surface of the Stock. Darken the barrel if the bluing has worn off, and camouflage the bayonet.

The Pack, Belt, and Canteen Cover Fade With Use. They are camouflaged by using paint, mud, charcoal, crushed grass, or any substance that blends with the terrain.

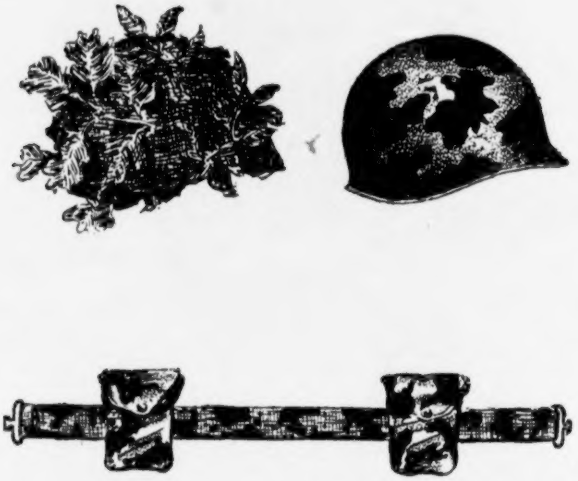


Figure 3. Camouflage your equipment.

Shadows Are a Form of Concealment. Notice how the men in the shadows in figures 4 and 5 are concealed. The men in the sunlight standout.

Observe From the Prone Position. This position presents a very low silhouette and makes it difficult for the enemy to observe you.

Expose Nothing That Shines. The reflection of light on a polished surface instantly attracts attention and is seen for great distances.

Keep off the Skyline. Figures on the skyline are seen from a great distance because the dark outline stands out against the light sky. The silhouette formed by the body makes a good target. Common violations of concealment are shown in figure 6.

SELECTION AND CONCEALMENT OF BATTLEFIELD POSITIONS

A foxhole is an individual, fortified position. Select a position which provides the necessary field or fire; then make it difficult for the enemy to find and to fire at you. Camouflage foxholes from ground and aerial observation. Dig it where you are not silhouetted against a contrasting background or the skyline. Keep equipment inside the hole. Bury ration cans so they do not reveal your position.

The pictures in figure 7 show correct battlefield positions used on a patrol or during a fast-moving attack. Study these pictures. Observe and fire around the side of an object. This conceals most of the head

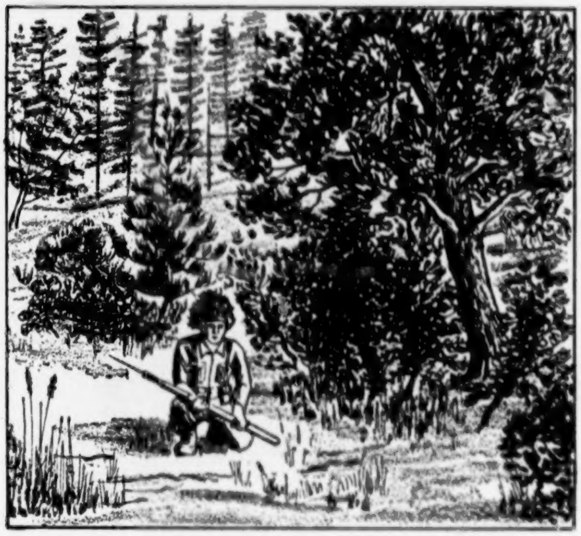
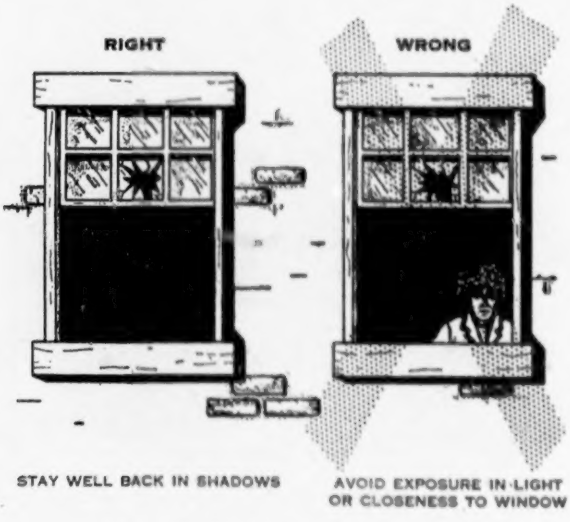


Figure 4. Shadows help hide you.



RIGHT
WRONG
STAY WELL BACK IN SHADOWS
AVOID EXPOSURE IN LIGHT OR CLOSENESS TO WINDOW

Figure 5. Stay back from a window.

and body. Observe and fire from the prone position whenever possible. You present a small target while taking advantage of concealing vegetation.

Select a good background before observing over the top of an object. For example, avoid observing over the top of a ditch unless a suitable background exists. In this way you avoid silhouetting your outline or contrasting your clothing and equipment. This reduces chances of detection.

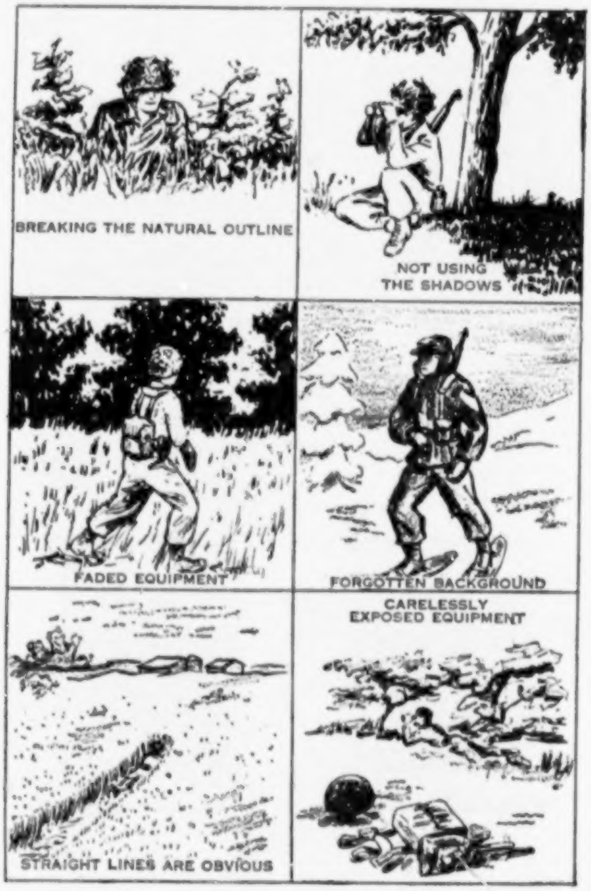

BREAKING THE NATURAL OUTLINE
NOT USING THE SHADOWS
FADED EQUIPMENT
FORGOTTEN BACKGROUND
STRAIGHT LINES ARE OBVIOUS
CARELESSLY EXPOSED EQUIPMENT

Figure 6. Do not make these errors in concealment.

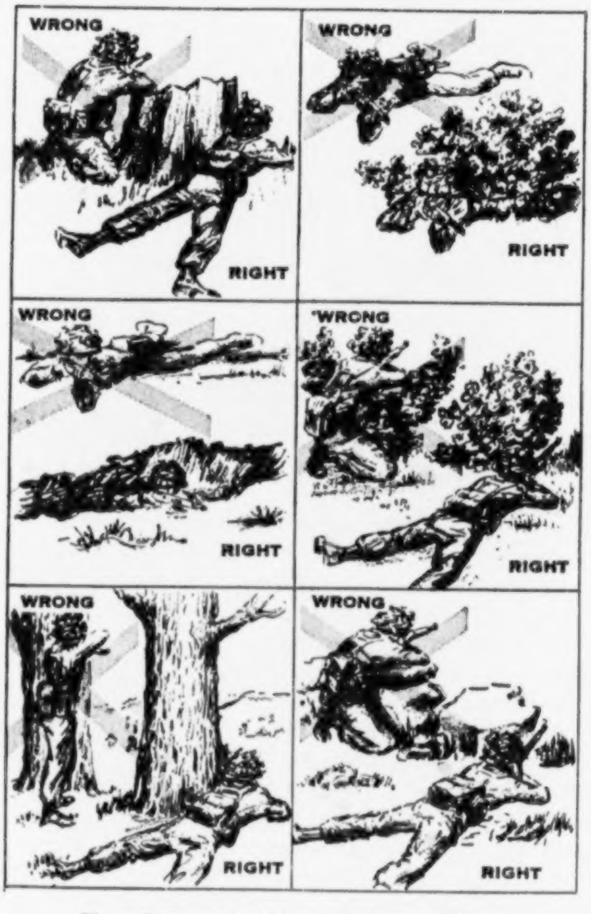

WRONG
RIGHT
WRONG
RIGHT
WRONG
RIGHT
WRONG
RIGHT
WRONG
RIGHT
WRONG
RIGHT

Figure 7. Correct and incorrect battle positions.

Chapter 2

INDIVIDUAL MOVEMENT

MOVEMENT BY DAY

INTRODUCTION

During daylight movement, observe the terrain over which you will travel. Select the best available covered and concealed route, taking advantage of patches of fog, smoke, haze, or dust. Tall grass offers concealment, but moving through it in a straight line causes it to wave in an unnatural motion, attracting the enemy's attention. Change direction slightly from time to time and move when the wind blows the grass.

The enemy is alert for movement of any kind; the flight of birds or movement by animals may attract attention. If you alarm birds or animals, remain in position for a few minutes and observe. To cross a road, select a place that offers the most cover and concealment, such as a large culvert, a low spot, or a curve. Cross as fast as you can. When your direction takes you across furrows, look for a low section in the field; crawl down a furrow to that low section, and begin your cross-furrow movement. Avoid loose stones or steep slopes.

Loud noises, exploding shells, or low-flying planes may attract the enemy's attention. Take advantage of these distractions.

CRAWLING

There are times when it is necessary to move your body close to the ground to avoid being seen. There are two ways to do this—the low crawl and the high crawl.

Low Crawl. The low crawl is used when cover and concealment are scarce. Keep your body as flat as possible against the ground. Grasp the rifle sling at the stock ferrule swivel. Let the balance of the rifle rest on your forearm and let the butt of the rifle drag on the ground (fig. 8, 1st position). To start, push your arms forward and pull your right leg forward (fig. 8, 2d position). To move, pull with your arms and push with your right leg. Frequently change your pushing leg to avoid fatigue (fig. 8, 3d position).

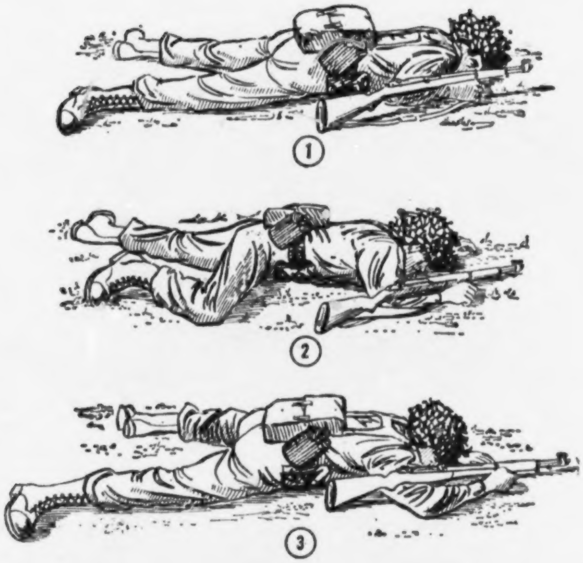


Figure 8. Crawling when cover and concealment are scarce.

High Crawl. When cover and concealment are available and you want more speed, use the high crawl. Keep your body free of the ground and rest your weight on your forearms and lower legs. Cradle the rifle in your arms, keeping its muzzle off the ground. Keep your knees well behind your buttocks (fig. 9). Move forward by alternately advancing your right elbow and left knee, left elbow and right knee.

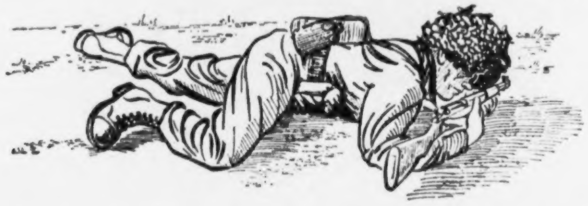
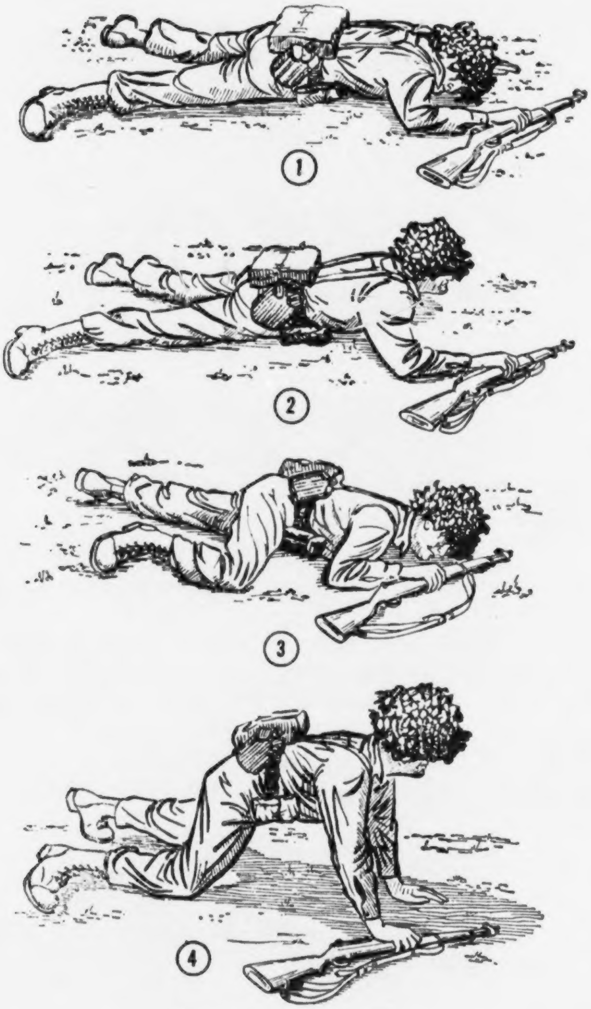


Figure 9. Crawling when cover and concealment are available.

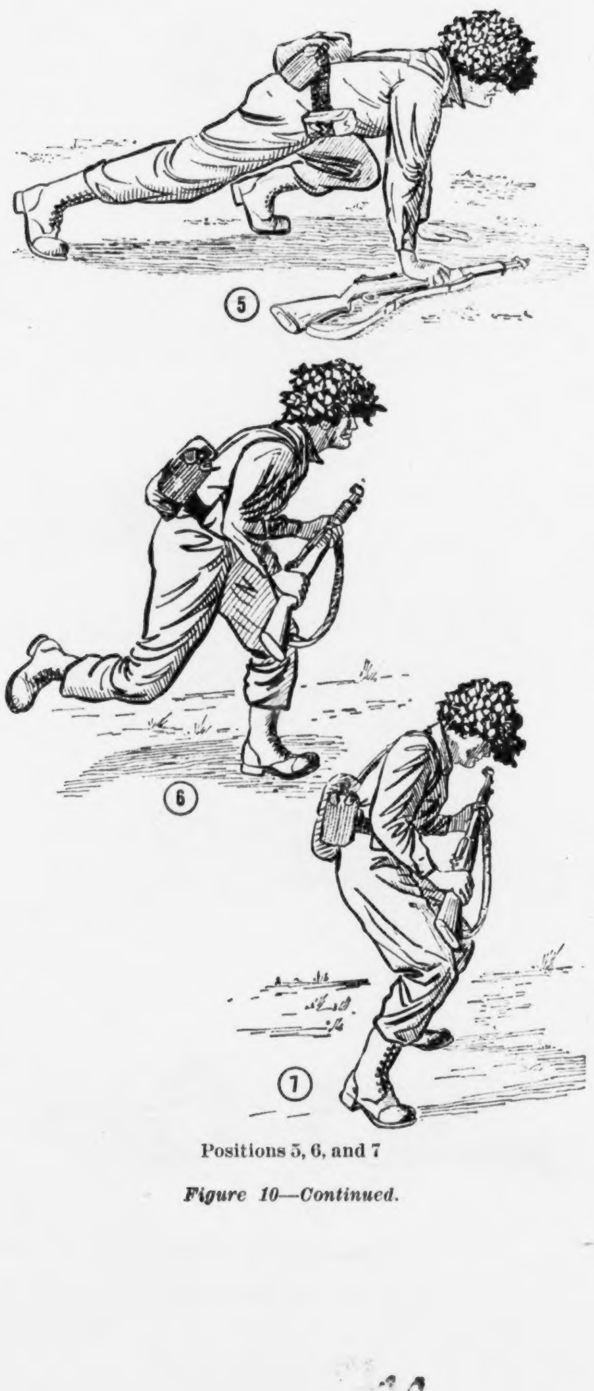
RUSHING

Rushing is the fastest way to move from one position to another. Start your rush from the prone position (fig. 10, 1st position). Slowly raise your head and select your next position (fig. 10, 2d position). Slowly lower your head. Draw your arms to the body, keeping the elbows down, and pull the right leg forward (fig. 10, 3d position). With one movement, raise your body by straightening the arms



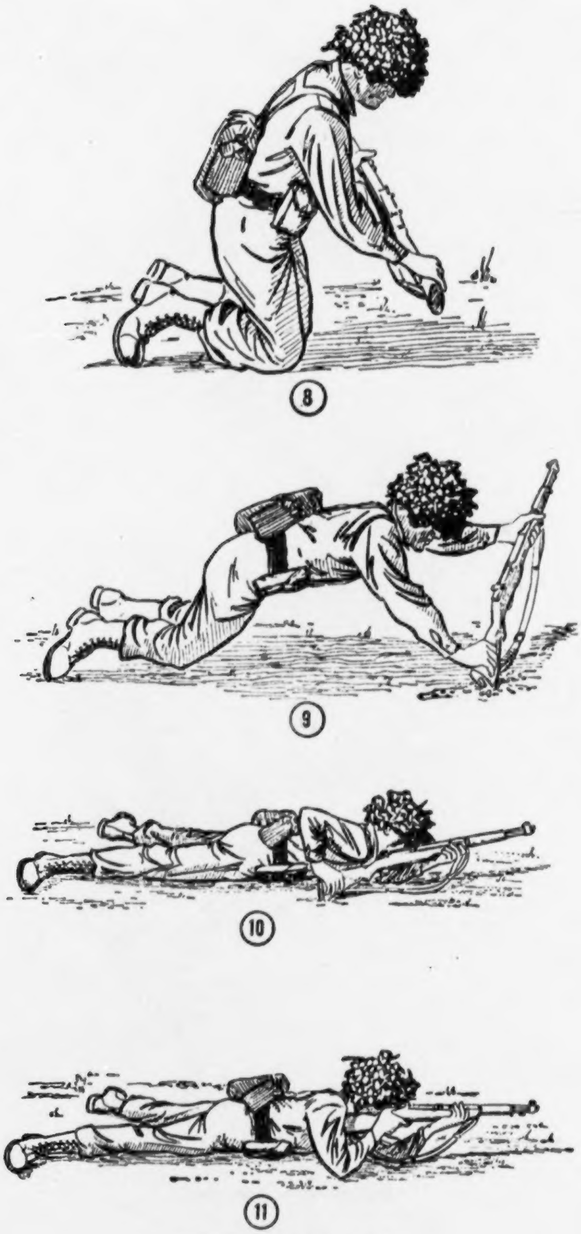
Positions 1, 2, 3, and 4

Figure 10. Rushing.



Positions 5, 6, and 7

Figure 10—Continued.



Positions 8, 9, 10, and 11

Figure 10—Continued.

(fig. 10, 4th position). Spring to your feet and step off with the left foot (fig. 10, 5th position). Run to the new position, using the shortest route (fig. 10, 6th position). Just before hitting the ground, plant both feet firmly (fig. 10, 7th position). Drop to your knees; at the same time slide your hand to the heel of the rifle butt (fig. 10, 8th position). Fall forward, breaking your fall with the butt of the rifle (fig. 10, 9th position). Shift the weight of your body to your left side. With your right hand, place the butt of the rifle in the hollow of your right shoulder and roll into a firing position (fig. 10, positions 10 and 11). Lie as flat as possible if you think you were observed by the enemy; move to the right or left if cover and concealment exist.

Notes. When movement is made while carrying the M16A1 rifle, the following is applicable:

1. Place the left hand on the handguard, left arm thrust forward. The right hand grasps the pistol grip, and the butt of the stock is held against the right hip. Then drop to your knees and remove your right hand from the weapon.
2. Fall forward, breaking the fall with your right hand well forward of the right knee and on line with your right knee and your target. Extend your left arm forward and lower your body onto your left side and elbow.

MOVEMENT BY NIGHT

INTRODUCTION

Darkness is an enemy only to the untrained; through training, darkness becomes a friend. The ability to operate efficiently at night affords a definite advantage over the enemy. By using darkness to conceal movement, you approach enemy positions more closely than during daylight and secure vital information concerning enemy installations, protective measures, troop units, and enemy-held terrain. Additionally, the effectiveness of the enemy's security system is reduced. By practicing the proper techniques of night movement, it is relatively easy to kill enemy personnel silently and to return safely to friendly positions.

PREPARATION FOR NIGHT MOVEMENT

Darkness limits enemy visibility considerably and permits movement over exposed terrain more freely than during daylight. Adverse weather such as rain, snow, or fog reduces the enemy's alertness; such factors are considered when planning to operate at night. The most important consideration is to carefully prepare yourself and equipment (fig. 11).

Boots. The issue Army boot affords comfort and protection to the wearer, especially when operating for extended periods or over rough terrain. If an unusual amount of stealth is desired, the rubber soled athletic shoe is more suitable.

Belt. Replace the belt with string or rope to eliminate the brass buckle. Remove all distinctive patches and metal insignia from the fatigue jacket, but leave the name tape and "US Army" insignia in place, camouflaging if necessary. Button the collar to conceal a white undershirt.

ID Tags. Cover identification tags with cloth or tape them together; if they are fastened to a metal chain, tape them to the chain so they do not slide or rattle.

Headgear. Avoid wearing a helmet or liner on a night patrol. They make a distinctive sound when brushed on limbs or when struck with solid objects. It is also difficult to hear while wearing the helmet. Wear a soft cap which lessens these disadvantages in addition to presenting

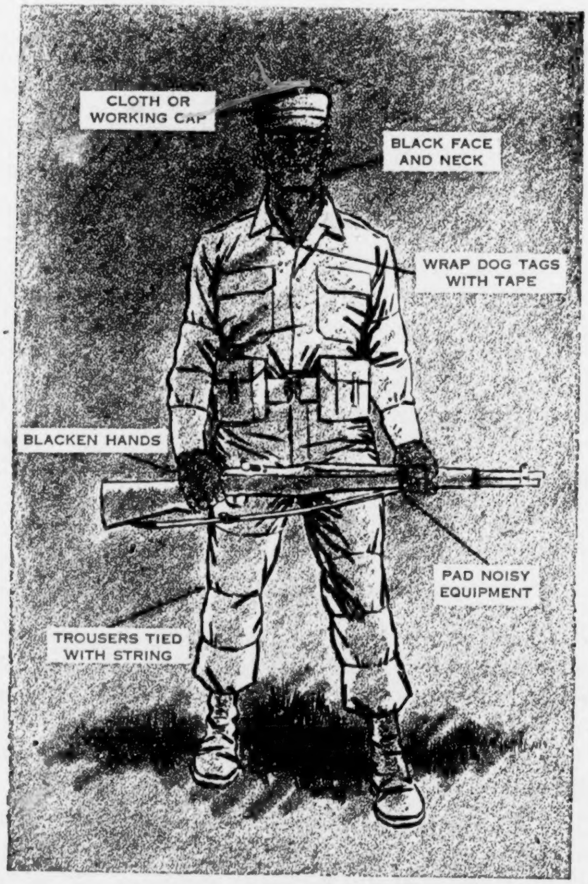

CLOTH OR WORKING CAP
BLACK FACE AND NECK
WRAP DOG TAGS WITH TAPE
BLACKEN HANDS
PAD NOISY EQUIPMENT
TROUSERS TIED WITH STRING

Figure 11. Dress carefully for night movement.

a less distinct outline. If the helmet must be worn, cover it with a rough cloth such as burlap.

Personal Items. Remove keys, coins, or noisy articles from your pockets. Also remove photos or papers that would provide the enemy with useful information.

Rifle. If the rifle sling is taken, tape it to the weapon to prevent snagging on bushes and trees. Always tape the stacking swivel and paint over the buckle to prevent glare. The sling can be used for many things—to secure splints, to improvise litters, and as a rope. Pad the oil and thong case with cotton or rifle patches so it does not rattle in the stock of the weapon.

Ammunition. If the ammunition belt is worn, cover shiny rivets and buckles with paint or mud. The bandoleer is excellent for night use and can be adjusted to fit snugly by tying a knot in the shoulder strap.

Skin Camouflage. Carefully tone down exposed skin surface on your face, neck, and hands to prevent the reflections of light.

SILENT WEAPONS

When planning to operate close to the enemy, you may want to take silent weapons to use in killing, stunning, or capturing individuals. The trench knife and bayonet are excellent weapons. They are carried without a scabbard. The blunt end of a hand ax can be used to stun an enemy; the cutting edge is employed to kill. A machete can also be used for cutting and stabbing.

Clubs, blackjacks, sticks, and pistol butts are used chiefly to stun; however, a hard blow on the temple or the base of the neck may kill. A blackjack is improvised by filling a sock with wet sand. If a club or stick is used as a silent weapon, be certain it is short and solid. Another effective weapon, the garrote, may be made by fastening a wood handle to each end of an 18-inch length of wire (fig. 12).

HOW TO MOVE AT NIGHT

The methods outlined here are employed when extreme silence is essential because of the nearness of the enemy. These are very slow and tiring movements and are used only when necessary.

To insure that footing is sure and solid, keep the weight on one foot as you step (fig. 13). Raise the other leg high to clear brush or high grass; then, with the weight on the rear leg, gently lower the toe first. As you can feel best with the toe, select a spot free of loose stones and dry sticks. Lower the heel after finding solid footing and then shift your weight and balance to the forward foot. To turn to a different direction, do not turn on the heel or ball of the foot. Using the above

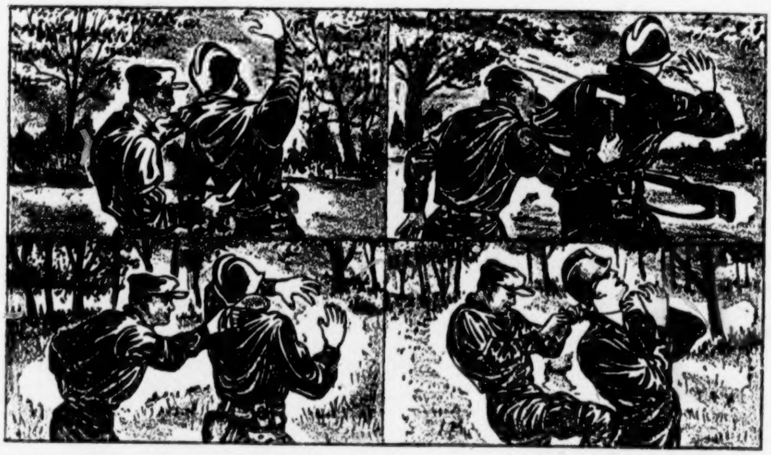


Figure 12. These weapons make no noise.

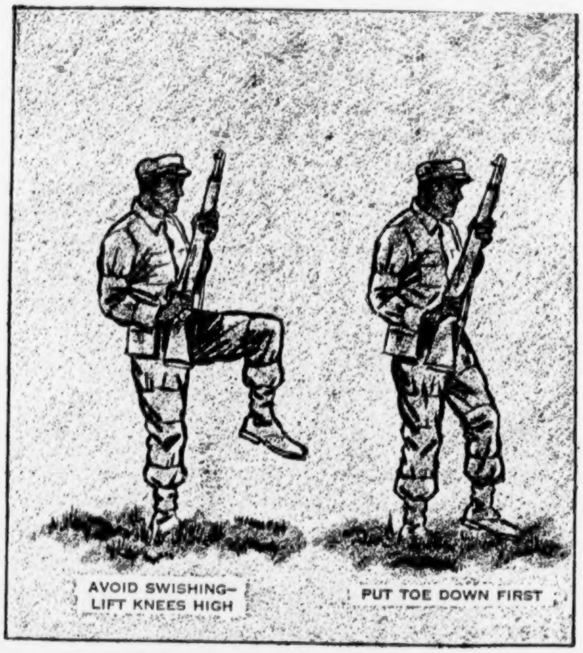

AVOID SWISHING–
LIFT KNEES HIGH
PUT TOE DOWN FIRST

Figure 13. Toe first and gently.

method, place the foot down so it points in the general direction desired; lift the other foot and place it in the same direction. Several such movements may be required in order to turn completely toward the objective or the desired direction.

To assume the prone position at night, crouch slowly (fig. 14), hold the rifle under the arm, and feel the ground with the free hand. Support the weight on the free hand and opposite knee. Raise the free leg up and back and lower it silently to the ground. Roll gently to that side and move the other leg into position in the same manner. Roll quietly back into the prone position. If your presence is detected by the enemy or you are fired upon, move into the prone position using the daylight technique.

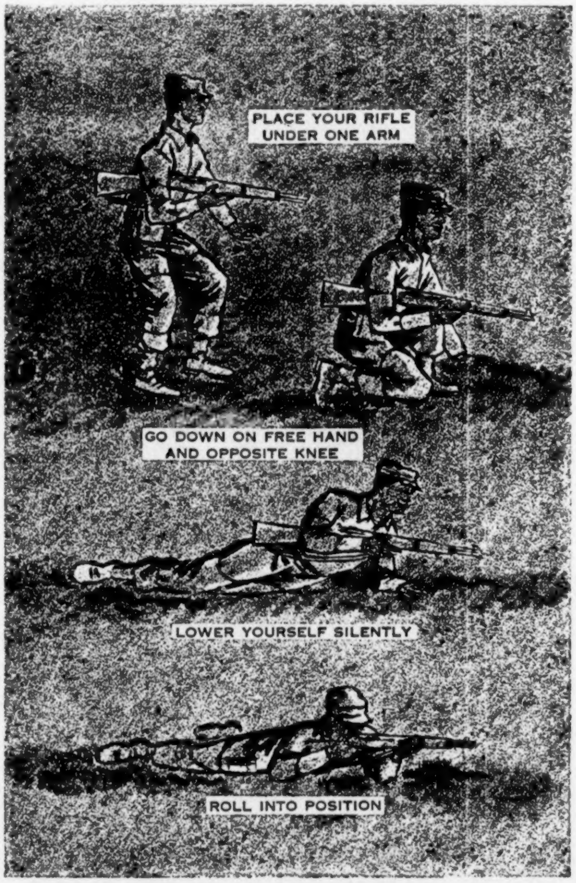

PLACE YOUR RIFLE UNDER ONE ARM
GO DOWN ON FREE HAND AND OPPOSITE KNEE
LOWER YOURSELF SILENTLY
ROLL INTO POSITION

Figure 14. Dropping to the prone position.

At night it may be necessary to crawl when within a few yards of the enemy. The method of crawling used during the day is not suitable at night because it makes a shuffling noise that is easily heard. Crawl on the hands and knees. Clear a small area to the side for your weapon and place the weapon on the ground so it is readily available. With the right hand, feel and clear a spot for the right knee; keep the hand on the spot and bring the knee forward to meet the hand. Lift the knee and foot clear of the ground; repeat the process with the left knee. When moving your weapon, feel for a spot, clear it, and lift the weapon up and forward, placing it gently into the new position. Each time a movement forward is made, extend one hand straight out and lower it slowly to the ground to locate trip wires or overhanging brush. Crawl very slowly, keeping movements noiseless and continue observing to the front (fig. 15).

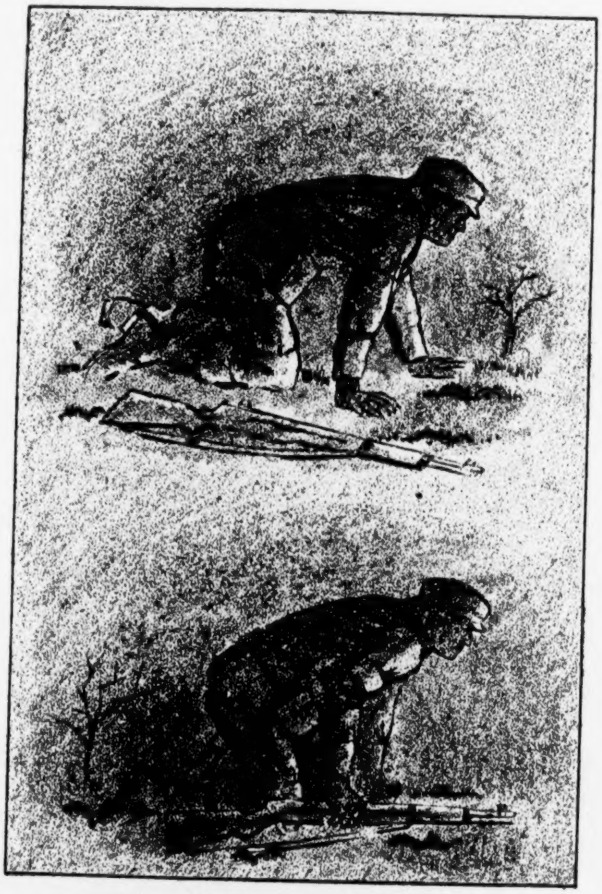


Figure 15. Crawl slowly and silently.

RULES FOR NIGHT MOVEMENT

Movement. Move short distances at a time. Halt, listen, then move again.

Direction. The best method of maintaining direction at night is through the use of all available navigational aids, such as a compass.

Terrain. Move in open terrain if possible; noise made while operating through woods, brush, or difficult terrain can be heard by the enemy. Also, moving in the open permits observation of more terrain features.

Sounds. Take advantage of sounds; artillery, rain, wind, and aircraft draw the enemy's attention and cover the sound of movement.

Running. Do not run at night except when absolutely necessary; running results in unnecessary noise and increases the possibility of falling.

Background. Pay attention to background at night; backgrounds are usually dark and shadows are intense. Do not silhouette yourself against the horizon. Utilize camouflage to blend yourself with the dark.

Flares. If an aerial flare bursts in the area, drop quickly and quietly to the prone position and remain still until the flare burns out. The enemy may be temporarily blinded and may not detect the sudden movement. Do not observe the flare as it impairs night vision. If a ground flare bursts, or when caught in a direct beam of light, move quickly to concealment. If caught by a flare while crossing an obstacle, such as barbed wire, crouch low and stay still until the flare burns out. If possible keep one eye closed. This prevents a total loss of night vision. If caught in any type of light during the assault, DO NOT STOP but continue the assault.

SOUNDS, SMELL, AND TOUCH

Sounds. Sounds are information. Learn to identify common battlefield noises—the snap of a twig, the click of a bolt, the rattle of a canteen. Learn to estimate the direction and range to sounds. Individuals are trained to be patient because they may have to listen for long periods. If wearing a helmet, a hood, or earflaps, remove them temporarily to listen. Sounds are heard better at night than during the day and better in damp air than in dry. Sounds travel through the air at a constant speed. It is possible to estimate distances if the action is seen and heard. When the flash of a weapon is seen, start counting at the rate of three counts per second; stop counting when the report of the weapon is heard. The number reached when the counting is stopped is the range to the weapon in hundreds of meters. If counting is stopped at the number three, the range to the gun is 300 meters; if the count is eight before the report of the weapon is heard, the range is 800 meters. To perfect this technique, use a stopwatch or the sweep second hand of a wristwatch during practice (fig. 16).

Smell. Smells such as cooking food, fires, cigarette smoke, and others assist in determining enemy actions and often reveal his location.

Touch. The sense of touch is effectively used when feeling for trip wires or enemy obstacles.

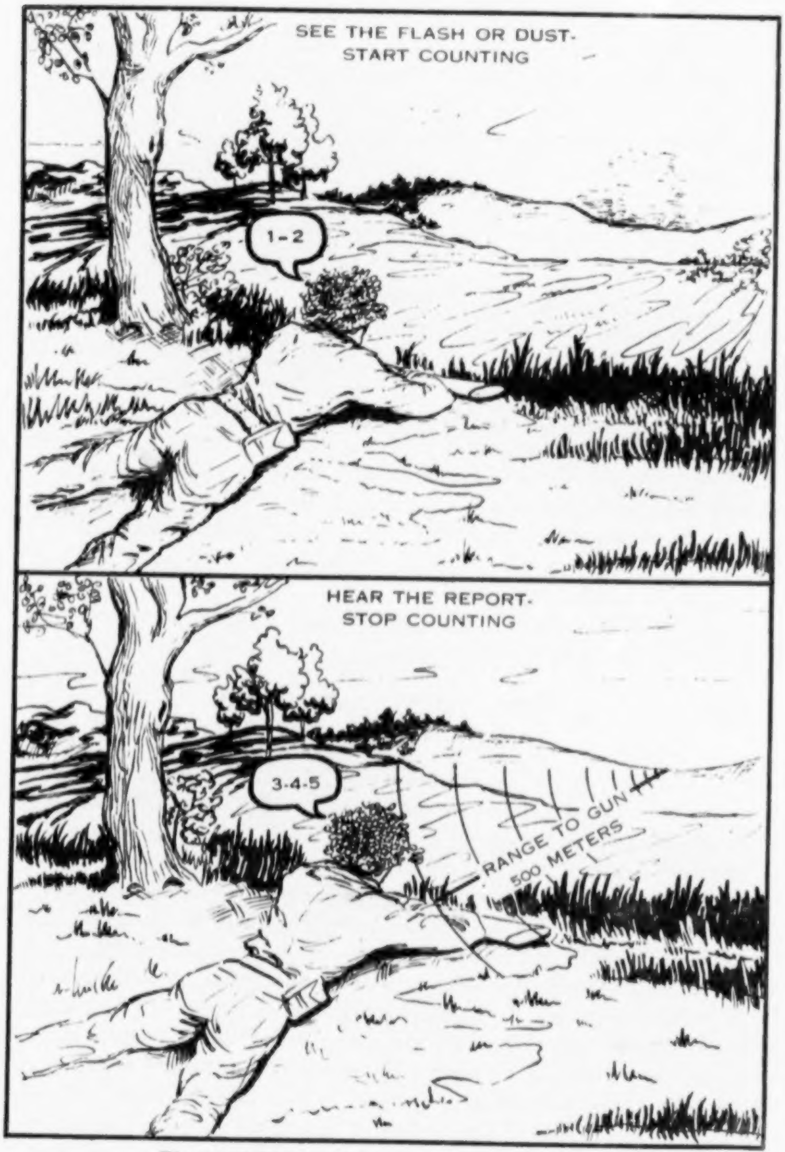

SEE THE FLASH OR DUST-
START COUNTING
1-2
HEAR THE REPORT-
STOP COUNTING
3-4-5
RANGE TO GUN
500 METERS

Figure 16. Flash and sound distance estimation.

CHAPTER 3

COMBAT FORMATIONS

GENERAL

Combat formations are groupings of individuals and units for effective tactical employment. The factors influencing the leader's decision as to the selection of any particular formation are the mission, terrain and weather, situation, desired rate of movement, and degree of flexibility.

The combat formations discussed in this chapter pertain specifically to elements of the rifle squad and are appropriate for most combat situations. However, they should not be thought of as the *only* formations which may be used. Some modifications of these formations may be necessary or desirable in certain situations.

The squad may often train or fight at less than full strength. Frequently, the formations used will be modified to conform with the strength of the squad. For the purpose of this discussion, all elements are full strength. Because of the firepower of the automatic rifles, these weapons' positions are maintained so far as possible. In selecting or modifying squad formations to conform to a particular situation, the following fundamentals generally apply:

Fire team integrity is maintained.

The fire team leader is located so as to facilitate control of the fire team, especially in its deployment.

The automatic rifles are located within each fire team to provide fire to the front, flanks, or rear of the squad.

When changing from one combat formation to another, the automatic riflemen should be required to move the least distance.

Unless otherwise directed, the ALFA team will lead or be the right fire team in the squad formations.

Within the fire teams, riflemen may be rotated to different positions.

SQUAD FORMATIONS

General.

a. The rifle squad is organized into two fire teams, ALFA and BRAVO (fig. 17).

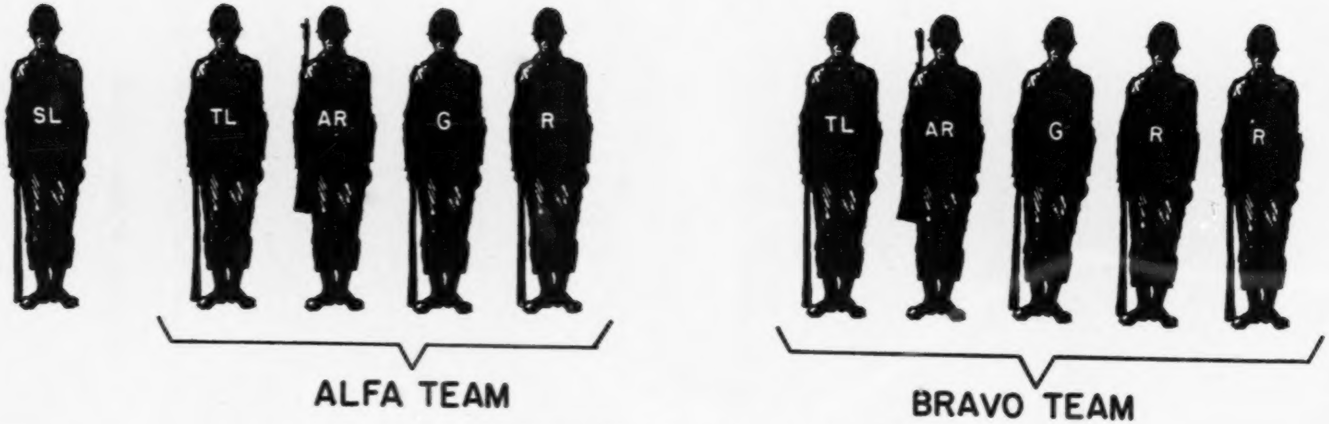

SL
TL
AR
G
R
ALFA TEAM
TL
AR
G
R
R
BRAVO TEAM

Figure 17. Organization of the rifle squad for combat.

b. The rifle squad combat formations are the squad column, squad file, and squad line. When the weapons squad moves as part of the platoon, it usually moves in column formation.

c. When moving as part of the platoon, the initial squad combat formation may be prescribed by the platoon leader. The squad leader may alter his formation to meet changes in the situation and terrain. The squad leader places himself within the formation where he can best exercise control. The squad observes at all times to the front, flanks, and rear. When moving or at a halt, members of the squad are responsible for observing in definite directions.

d. The squad leader controls the squad by oral commands, audible battlefield signals, arm-and-hand signals, use of his fire team leaders, and his personal presence. Based on the squad leader's order, fire team leaders position themselves in the designated formation, and other members of the squad take their appropriate positions based on the location of their fire team leader, or as the team leader directs.

e. The distances between individuals within a formation will vary, depending primarily on the visibility and the terrain over which the squad is moving. While maximum dispersion is desirable to reduce vulnerability to direct and indirect fires, effective control must be maintained. In open terrain the squad formation will be more dispersed. In close terrain (such as woods or heavy underbrush), distances between individuals must be reduced considerably to permit control.

Squad Column. This is the basic formation for movement. It is normally used when the squad is moving as part of the platoon under conditions when dispersion, laterally and in depth, is possible without sacrificing control. While in this formation, the squad is able to deliver a large volume of fire to the flanks but only a limited amount to the front. The squad column is a flexible formation which facilitates the use of battle drill. Two basic variations of the squad column are shown, the first with fire teams one behind the other (in column) and the second showing the fire teams abreast. Either of these may be modified by the squad leader to provide greater dispersion laterally or in depth.

a. Squad column with fire teams in column. This variation is used most frequently in areas where maneuver of the rear (trailing) fire team is unrestricted. This formation facilitates the use of battle drill because the leading fire team can immediately engage the enemy while the trailing team is used to maneuver. The ALFA team leads in the formation unless otherwise directed by the squad leader. To facilitate control, the teams may be kept close to each other as shown in figure 18. When terrain and visibility permit, the squad leader may separate his fire teams, having the rear team follow at a specific distance as shown in figure 19. The distance between fire teams in this formation is not so great that the squad leader cannot have direct, immediate control over the rear team.

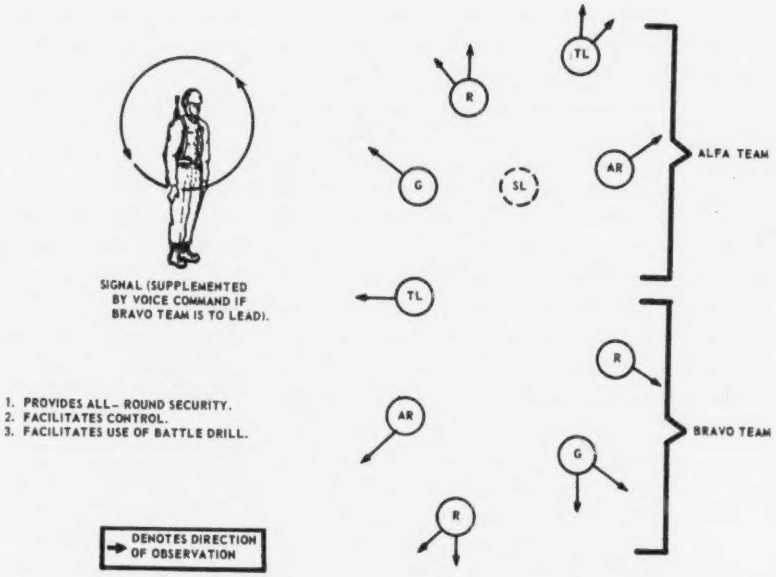

SIGNAL (SUPPLEMENTED BY VOICE COMMAND IF BRAVO TEAM IS TO LEAD).
1. PROVIDES ALL- ROUND SECURITY.
2. FACILITATES CONTROL.
3. FACILITATES USE OF BATTLE DRILL.
DENOTES DIRECTION OF OBSERVATION
TL
R
AR
G
SL
ALFA TEAM
TL
R
AR
G
R
BRAVO TEAM

Figure 18. Squad column with fire team in column showing ALFA team leading.

b. Modification of the squad column. The squad column may be modified by the squad leader as necessary to conform to the terrain and to provide a greater capability to deliver fire immediately to either the front or rear, thus providing all-round security. Such modification consists of the squad leader instructing those individuals in the center of the formation to move farther to the flanks (fig. 20). This variation is used most frequently when the squad is separated from other elements of the platoon.

c. Squad column with fire teams abreast (*fig. 21*). This variation of the squad column is used for movement in areas where maneuver of the fire team is restricted. It is used most frequently in the approach march when the squad is moving along a road. Under such conditions, the fact that the enemy may have the road covered by fire will frequently prevent moving personnel across the road once the squad is brought under fire, even if the fire teams are separated as shown in figure 18. Consequently, fire teams are placed abreast to facilitate their deployment on each side of the road without having personnel cross it. ALFA team is on the right unless otherwise directed by the squad leader. The squad leader will normally move in the column along the side of the road where he can best control the squad.

Squad File (*fig. 22*). This formation is used for moving over terrain which is so restrictive the squad cannot adopt a column formation, or when visibility is so reduced control becomes extremely difficult. This

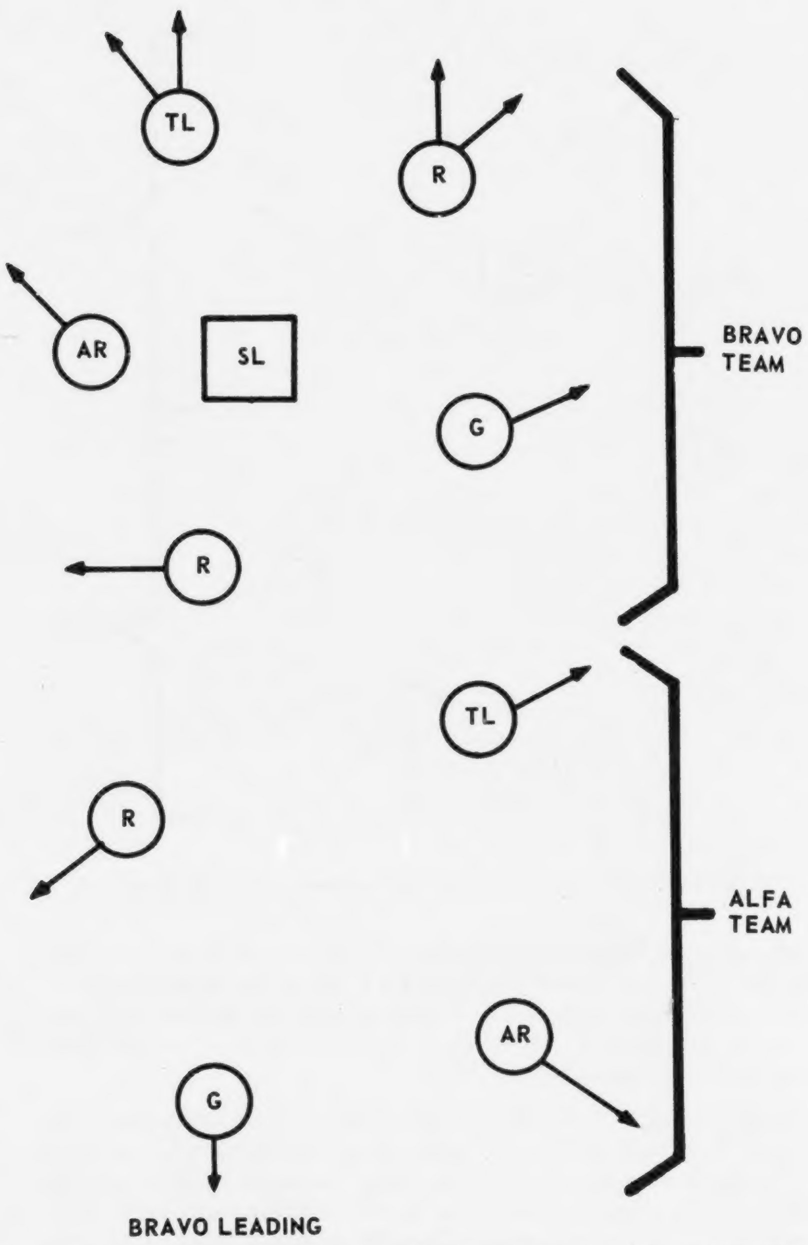

TL
R
BRAVO
TEAM
AR
SL
G
R
TL
R
ALFA
TEAM
AR
G
BRAVO LEADING

Figure 19. Variation of squad column with fire teams in column, showing BRAVO team leading, ALFA team trailing at a distance.

28

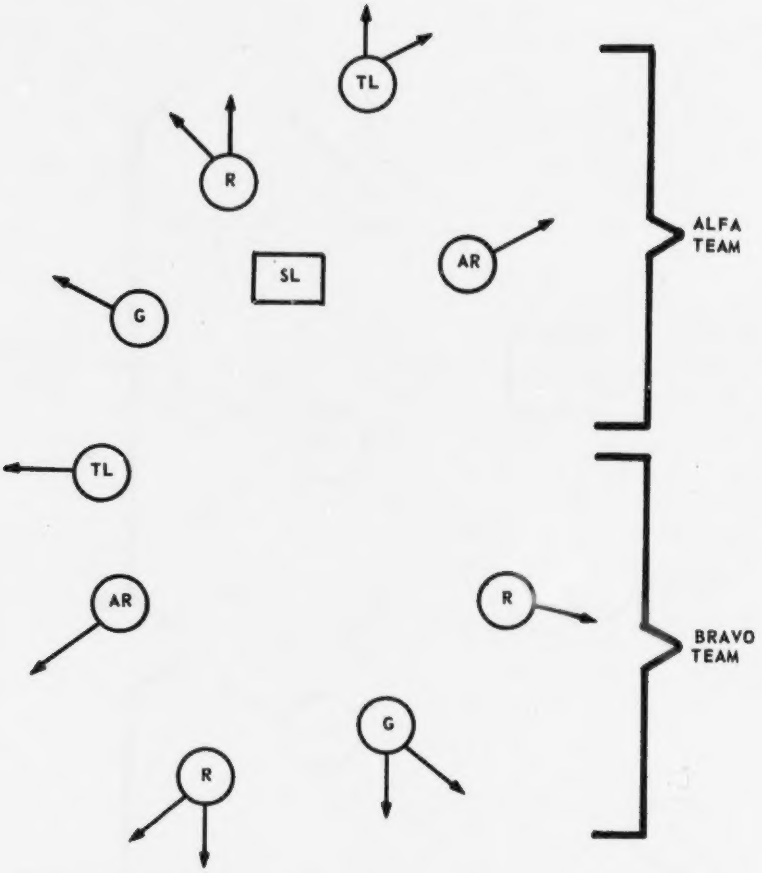
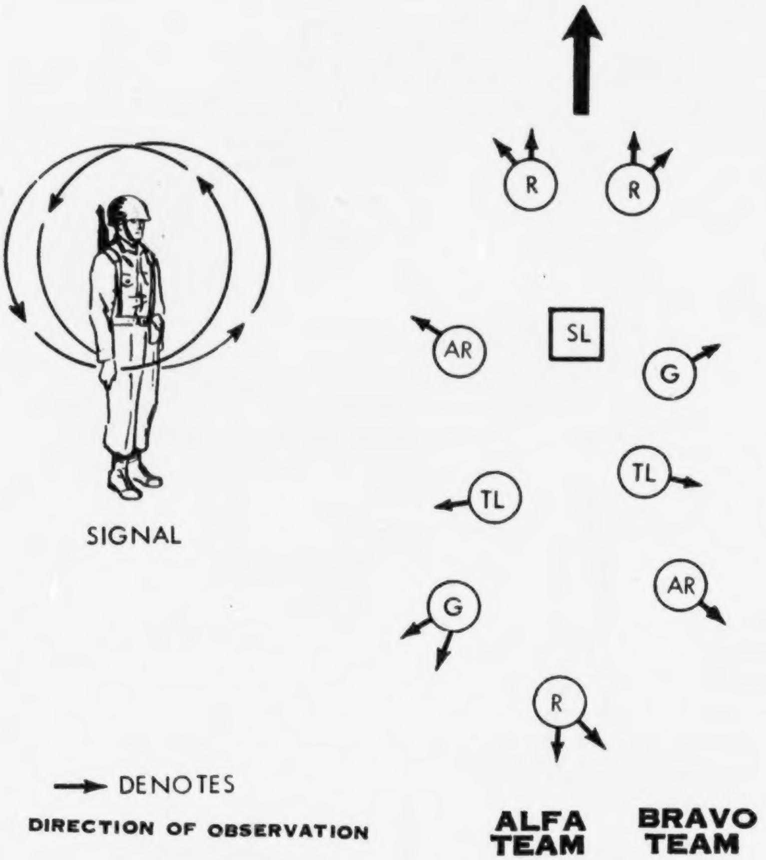


Figure 20. Example of modification of squad column (fire teams in column).

formation facilitates control of movement and allows greater firepower to the flanks, but limited firepower forward and to the rear. Deployment of the squad from this formation is not as easy as from the squad column. Positions of individuals as shown in figure 22 are not fixed, but may be altered as desired.

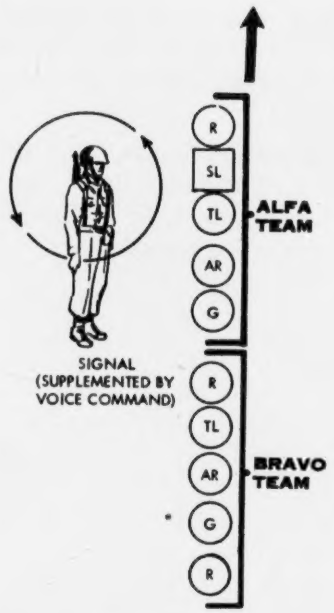
Squad Line (*fig. 23 and 24*). This is the basic assault formation of the squad. It is also suitable for mopping up enemy resistance and for crossing short, open areas. It provides maximum firepower to the front, but is relatively difficult to control. Specific locations of individuals within the formation, especially automatic riflemen, may be changed by the squad leader in a particular situation to provide greater concentration of fire in a certain area. The squad leader must designate a base fire team for the assault. Normally the base fire team will be the one which had been leading.

Formation Changes. Changing from one combat formation to another is accomplished without halting the squad. The fundamentals listed above should be followed as closely as possible. To facilitate learning, a simple numbering system may be used.


SIGNAL
R
R
SL
AR
G
TL
TL
G
AR
R
→ DENOTES
DIRECTION OF OBSERVATION
ALFA TEAM
BRAVO TEAM

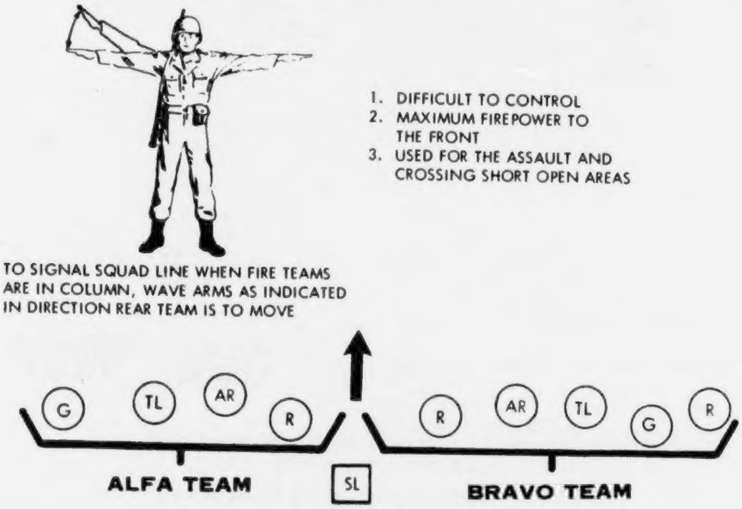
1. Provides all-round security.
2. Facilitates deployment of squad on each side of road.
3. Used most frequently on a road or trail.

Figure 21. Squad column with fire teams abreast.


SIGNAL
(SUPPLEMENTED BY VOICE COMMAND)
R
SL
TL
AR
G
ALFA TEAM
R
TL
AR
G
R
BRAVO TEAM

1. Limited firepower to front and rear
2. Maximum firepower to flanks
3. Facilitates control and movement
4. Commonly used in dense terrain and reduced visibility when speed and control are essential

Figure 22. Squad file showing ALFA team leading.


G
TL
AR
R
R
AR
TL
G
R
ALFA TEAM
SL
BRAVO TEAM

1. DIFFICULT TO CONTROL
2. MAXIMUM FIREPOWER TO THE FRONT
3. USED FOR THE ASSAULT AND CROSSING SHORT OPEN AREAS

TO SIGNAL SQUAD LINE WHEN FIRE TEAMS ARE IN COLUMN, WAVE ARMS AS INDICATED IN DIRECTION REAR TEAM IS TO MOVE

Figure 23. Squad line, ALFA team on left.

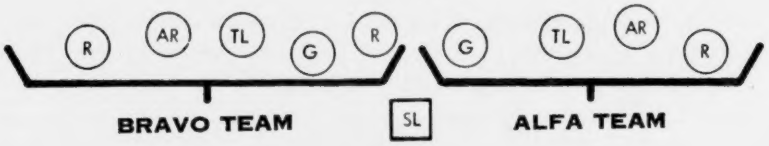


Figure 24. Squad line, ALFA team on right.

MOVEMENT BY BOUNDS

When not in direct contact with the enemy, the squad moves with the greatest degree of security consistent with the assigned mission and the requirement for speed. When continuous movement is required, this security may be facilitated by moving in squad column with one fire team following the other at a prescribed distance. Other conditions may require the squad to advance its fire teams by bounds.

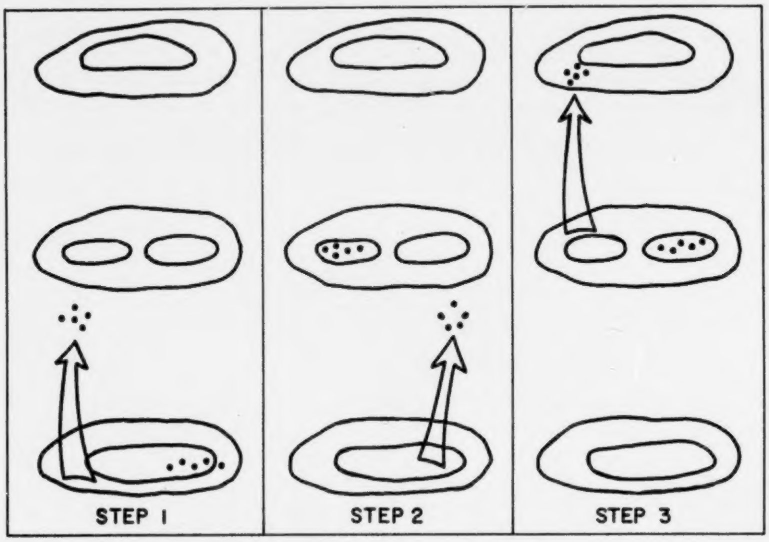


Figure 25. Movement by successive bounds.

Movement by bounds may be appropriate when the squad must cross an exposed area which may be covered by enemy fire. In using this technique, the squad leader designates one fire team to occupy firing positions from which it can cover the movement of the other team across the open area. The team in position normally does not fire unless the enemy is detected. After the fire team has crossed the open area, the team in position is signaled to move forward. Such movement may be continued with teams advancing either by successive bounds (fig. 25) or by alternating bounds (fig. 26).

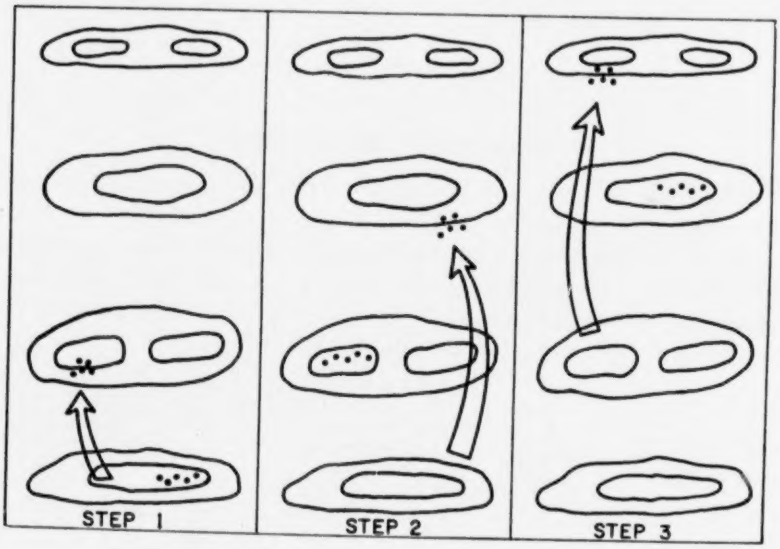


Figure 26. Movement by alternating bounds (leapfrogging).

CHAPTER 4

BATTLE DRILL

GENERAL

Battle drill is the immediate action taken by a squad or platoon to return fire and deploy against the enemy in any situation without issuing lengthy orders. Battle drill is used in the conduct of the attack when the small unit is faced with an unexpected enemy situation which makes the original plan of attack either invalid or incomplete. In these surprise situations, rapidity of thought and action are essential to success. Although it will be necessary in these situations for the leader to make a rapid estimate of the situation, the unit proficient in battle drill can go into action on receipt of a single command or a fragmentary order to close with and destroy or capture the enemy. Emphasis is placed on building up firepower before maneuver is executed. The combat formations described in chapter 3 are used as a starting point in the execution of battle drill maneuvers. Battle drill may be initiated from any of the combat formations listed in chapter 3.

PRELIMINARY TRAINING

The execution of battle drill maneuvers depends in great part on fundamental skills of the individual soldier, as well as the teamwork generated in the conduct of instruction in combat formations. Prior to the training that must be conducted to achieve coordinated team action, individual skills of the soldier must be stressed to a high degree.

Marksmanship. The individual's ability to deliver an accurate volume of fire with his weapon is a most important fundamental. This skill is achieved in the present training programs, but the combat leader must impress upon his subordinates the importance of the accurate, well-distributed fire of each member of the unit to accomplish the mission.

Combat Training. The skills developed in individual combat training enable the soldier to recognize and use cover and concealment while observing or firing on the enemy, and to fire and maneuver toward a position in a series of rushes from one firing position to another. Proficiency in all of these skills must be achieved by the individual for him to contribute to the coordinated and effective team action of his squad.

Battlefield Signals. Signals are used when oral commands or warnings are inadequate. Battle drill is directed toward the elimination of lengthy verbal orders. Consequently, each soldier must be thoroughly trained in the use of arm-and-hand and whistle signals.

Arm-and-hand signals indicating that a movement is to be executed by a particular unit should be preceded by a signal designating the unit or units to accomplish the movement. Arm-and-hand signals are used with oral commands throughout the instruction in battle drill to insure the men become thoroughly familiar with the meaning of the signal used. Audible signals should be combined with visual signals when the leader transmits his orders. As the members of the squad and platoon become familiar with the arm-and-hand signals for the various battle drill actions, whistle signals should supplement oral commands.

Note. Initial orientation which discusses the importance of battle drill and the part it plays in the overall success of a unit is usually presented by the platoon leader or company commander. Instruction in the individual skills and presentation of the remaining portions of this chapter as pertains to the squad should be conducted by the squad leader. The following paragraphs are a logical sequence for training.

INDIVIDUAL BATTLE ACTION

Individual battle action exercises train the soldier to utilize the best cover and concealment, to choose the best avenues of approach, to develop the ability to move forward while presenting a minimum target, and to locate enemy positions while rushing from one firing position to another. They should be conducted so as to give each member of the rifle squad experience in movement over varied types of terrain. A large area should be selected containing stumps, logs, scrub brush, folds in the ground, and holes from which the soldier can choose firing positions during his movement. The individual should be forced to make instantaneous decisions as to firing positions, cover, and directions of advance. He should be able to see and not be seen when he interrupts his advance to select a position from which to fire. He should select a route forward that offers the best cover and concealment during his forward movement.

The exercises may be conducted on any varied terrain and should be controlled and supervised by the squad leader. Repeated instruction should be continued until all members of the squad have displayed proficiency. The individual should receive a critique by the squad leader after each running. This critique should cover his method of starting from a firing position, moving from one firing position to another, choice and methods of getting into positions, and the use of cover and concealment. Camouflaged Aggressor targets can be placed in the training area to test the individual's ability to locate the enemy during his movement.

ELEMENTARY FIRE AND MANEUVER

Exercises in elementary fire and maneuver or fire and movement develop within the rifle squad the instinct and timing necessary for coordinated teamwork in the attack. Realistically conducted, they enable the members of the squad to practice the principles of team action in attacking and assaulting a position. Aggressiveness and teamwork are essential to the success of any unit.

Only by repeated execution of fire and maneuver on these basic courses can the rifle squad develop the instinct and timing to operate smoothly as a team. It must train under stress of physical exertion and hazardous conditions; it must operate over all types of terrain to achieve that unity of action in which some men will always be in a position to fire while other members are advancing.

Courses for fire and maneuver and/or movement exercises should be constructed in areas of varied terrain. The exercises should be conducted initially in normal training areas using blank ammunition, with the final exercise being run with live ammunition in a range area.

CONDUCT OF TRAINING

Exercises in elementary fire and maneuver and/or movement should be conducted in two phases.

The first phase (fig. 28) in which two men participate is restricted to an area about 25 to 30 meters wide. There is a minimum of 10 meters between men. The men advance in rushes from one firing position to another. One man starts the advance by rushing to a firing position while the other man takes up the fire against the enemy. Then the second man rushes to a more advanced position while the first man takes up the fire. This action continues until both men are within hand grenade range of the targets. Here the first man throws a simulated hand grenade and both men assault simultaneously.

In the second phase (fig. 29) each *fire team* is divided into *two groups* (ALFA and BRAVO). This exercise is conducted over an area about 100 to 120 meters wide and 250 meters long. One fire team participates while the other observes. A minimum of 10 meters between men is maintained. The team leader controls one group and one of the men in the other group is designated as its leader. The two groups move forward toward a starting position as if they were the leading fire team in a squad column. At a signal indicating the groups have come under effective enemy fire, they drop to the ground and return fire immediately. By individual rushes, the team members move to positions generally on line with the team leader. As soon as the enemy is located, the team leader of ALFA starts the advance by rushing a short distance toward the objective, covered by the fire of the other members of ALFA and BRAVO. When the team leader reaches a new position and takes up the fire, a rifleman of ALFA moves up to a firing position, begins to fire, and is followed by another rifleman of ALFA. When all members of ALFA have taken up new firing positions, BRAVO starts its advance following the same procedure as ALFA. Each of the groups alternates forward in this manner until fire superiority is achieved, or they come within hand grenade range of the enemy position. At the signal of the team leader, all members of ALFA throw simulated hand grenades. When the grenades explode, both groups move toward the position, forming an assault line, moving at a rapid walk and firing well-directed shots from the underarm or shoulder position. A similar exercise is conducted using the BRAVO team.

These exercises may be conducted over normal training areas using blank ammunition and an Aggressor detail, or on a firing range using live ammunition and silhouette targets. The exercise should be controlled and supervised by the squad leader. Groups and teams should be alternated until each member of the fire team displays proficiency in each position. A critique should be conducted at the conclusion of each phase: selection of firing position, proper method of rushing, best utilization of the terrain, and teamwork in fire and maneuver in the assault. Errors by individual members of the squad should be corrected at the conclusion of the exercise.

SQUAD TEAMS

The organization of the rifle squad into two fire teams provides the squad leader with two elements to execute fire and movement and/or fire and maneuver. Essentially, one fire team is the maneuver element, while the other is the fire support element. The role of each fire team may change during the conduct of any particular action. For example, if the maneuver element is prevented by enemy action or terrain from closing with the enemy, then it assumes the fire support role to cover the advance of the other team, which then becomes the maneuver element.

Although the rifle squad is organized into two teams, this organization does not prevent the squad leader from altering the organization of his maneuver and fire support elements to conform to a specific situation. When the terrain offers excellent firing positions and more firepower is required in the fire support element than can be provided by one fire team, the squad leader may designate both automatic weapons, one or two grenadiers, and one of the fire team leaders to act as the fire support element, with the remainder of the squad acting as the maneuver element. However, such a subdivision of the squad takes time to accomplish and loses some of the squad's precision and interchangeability of fire teams.

FIRE SUPPORT AND MANEUVER ELEMENTS

The fire support element assists the maneuver element in its advance toward the enemy position by engaging all known or suspected targets. It continues its fire until masked by the maneuver element (fig. 27).

This element is aggressive in its action. While delivering fire on the enemy, if necessary, it continues to move closer to a more favorable firing position without losing continuous fire support. When the maneuver element masks its fires, the fire support element moves forward to assist in consolidation.

The mission of the maneuver element is to close with and destroy or capture the enemy. It advances and assaults under the close fires of the fire support element.

The maneuver element's principal job is to maintain the advance toward the enemy. It uses available cover and concealment to the maximum, creeping and crawling when necessary. Depending upon the terrain and effectiveness of the supporting fire, the maneuver element advances by fire team movement, fire and movement within the team, or creeping and crawling. Regardless of how it moves, it must continue to advance. If terrain permits, the maneuver element may be able to move forward, under cover and concealment, to positions within hand grenade range of the enemy (fig. 27).

CONTROL OF THE SQUAD

The squad leader is assisted in the control of the squad by the fire team leaders. The organization of the squad into fire teams in no way prevents the squad leader from directly controlling individual squad members. The squad and fire team leaders display positive and forceful leadership when executing battle drill.

The squad leader gives the necessary command or signal to execute the desired battle drill action. Fire team leaders initiate the action directed by the squad leader. If necessary, they repeat the command signal. Fire team leaders act as fighter-leaders, controlling their fire teams primarily by example. Fire team members base their actions on their fire team leader. Throughout the action, fire team leaders exercise such positive control as is necessary to insure that their fire teams

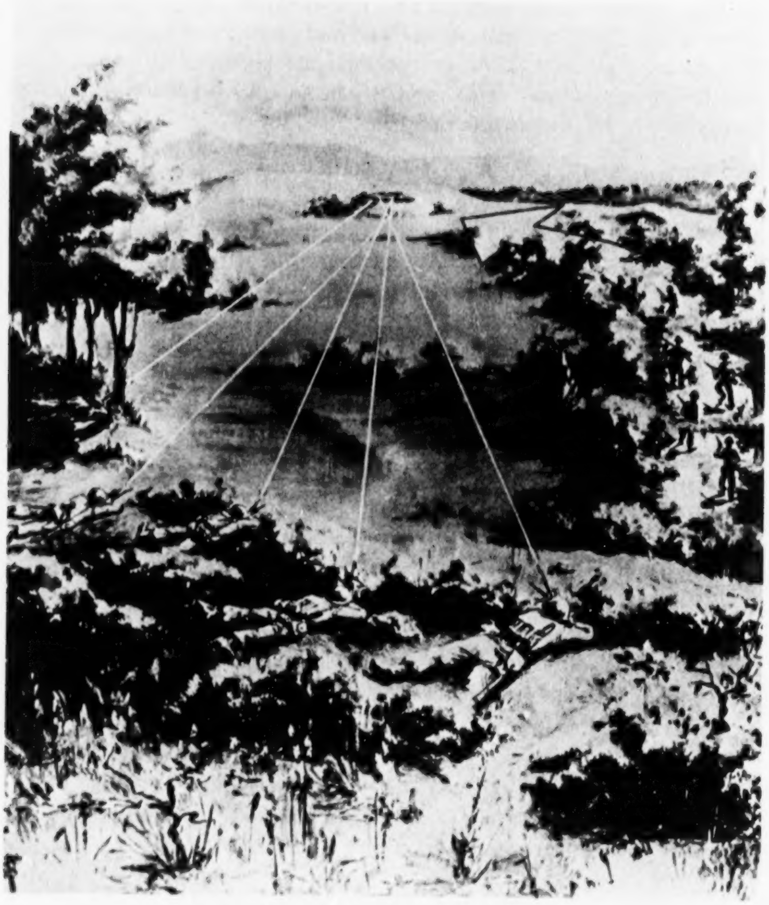


Figure 27. Battle drill (maneuver right).

function as directed. The squad leader locates himself where he can best control and influence the action. Normally, he will move with the maneuver element.

In a situation in which the squad is brought under effective small arms fire while advancing, certain actions are automatic. Those in position to return fire do so immediately. Members of the leading fire team move by individual rushes, or by creeping and crawling, to take advantage of all cover provided by the terrain and supporting fire. They move to positions generally abreast of their fire team leader and attempt to gain fire superiority over the enemy (fig. 28). The squad leader quickly makes an estimate of the situation, decides his course of action, and signals his plan. His plan provides for gaining fire

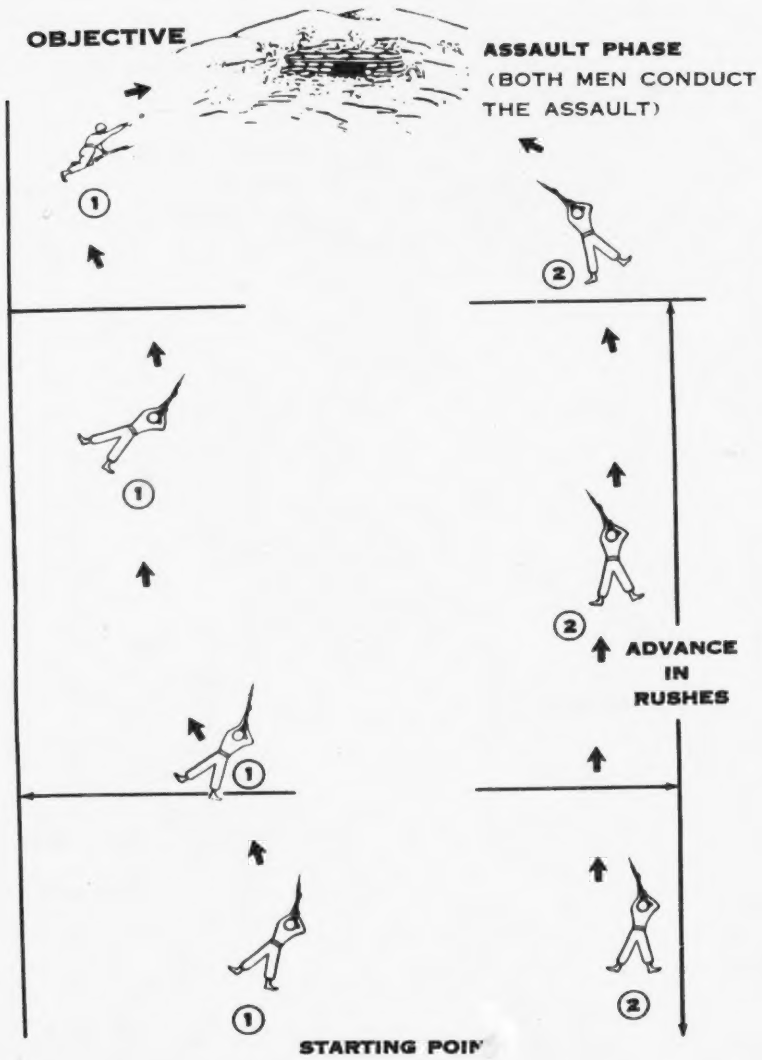

OBJECTIVE
ASSAULT PHASE
(BOTH MEN CONDUCT
THE ASSAULT)
①
②
①
②
ADVANCE
IN
RUSHES
①
①
②
STARTING POIN

Figure 28. Individual fire and movement.

superiority before entering the final assault phase. The final assault phase includes:

Fire and maneuver: right, left, front (figs. 30 and 31).
Fire and movement by fire teams (figs. 29 and 31).
Individual fire and movement (fig. 28).

Note. It may be necessary to employ more than one of these methods to reach a point where assault fire techniques can be employed. The choice of any of the above methods is entirely dependent on the effectiveness of enemy fires from the objective.

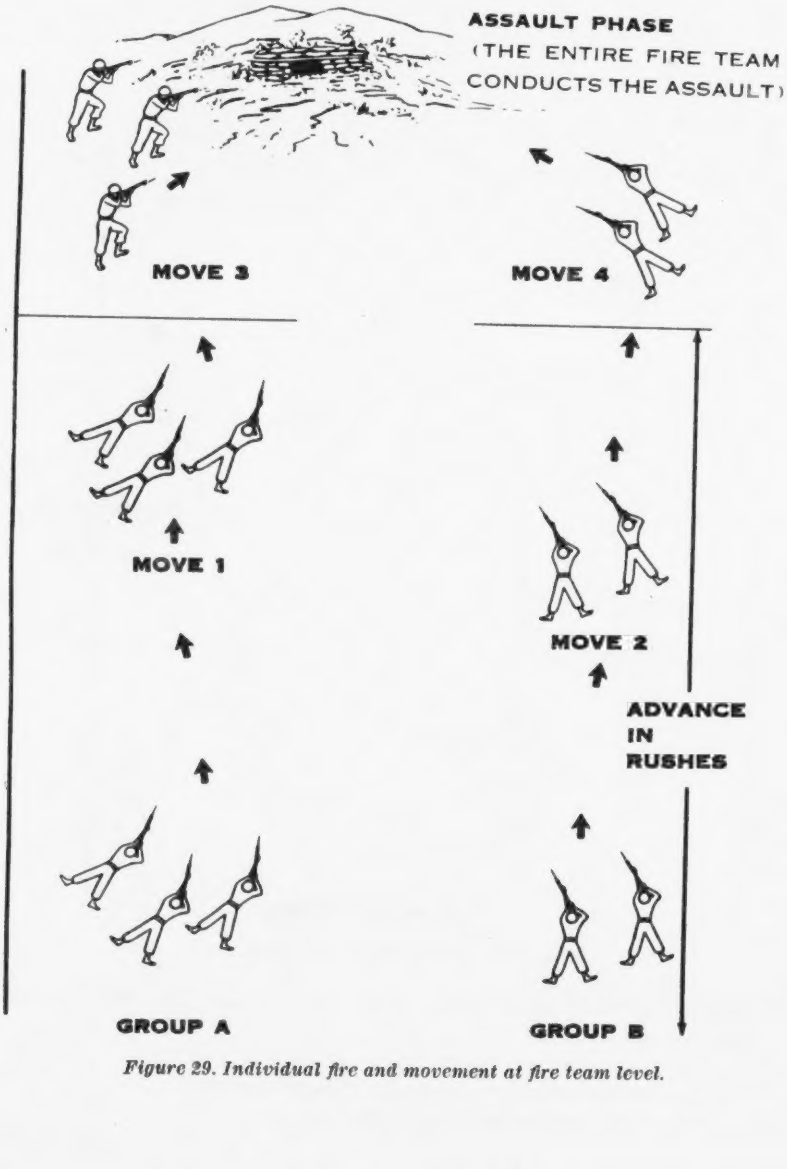

ASSAULT PHASE
(THE ENTIRE FIRE TEAM CONDUCTS THE ASSAULT)
MOVE 3
MOVE 4
MOVE 1
MOVE 2
ADVANCE IN RUSHES
GROUP A
GROUP B

Figure 29. Individual fire and movement at fire team level.

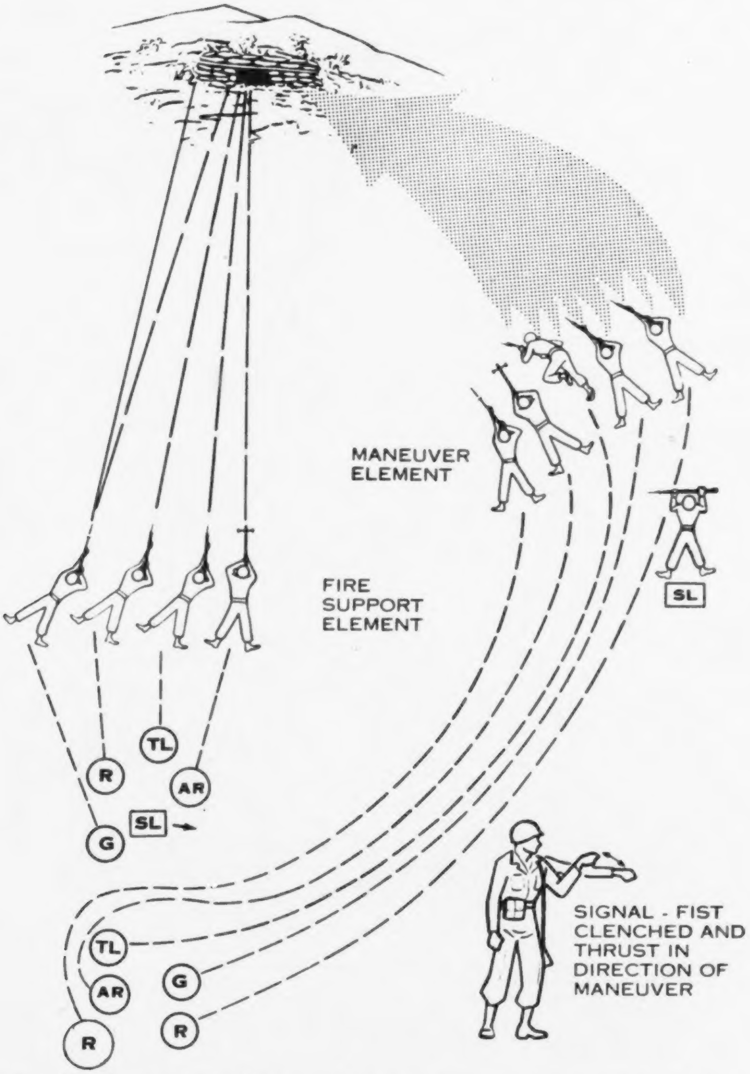
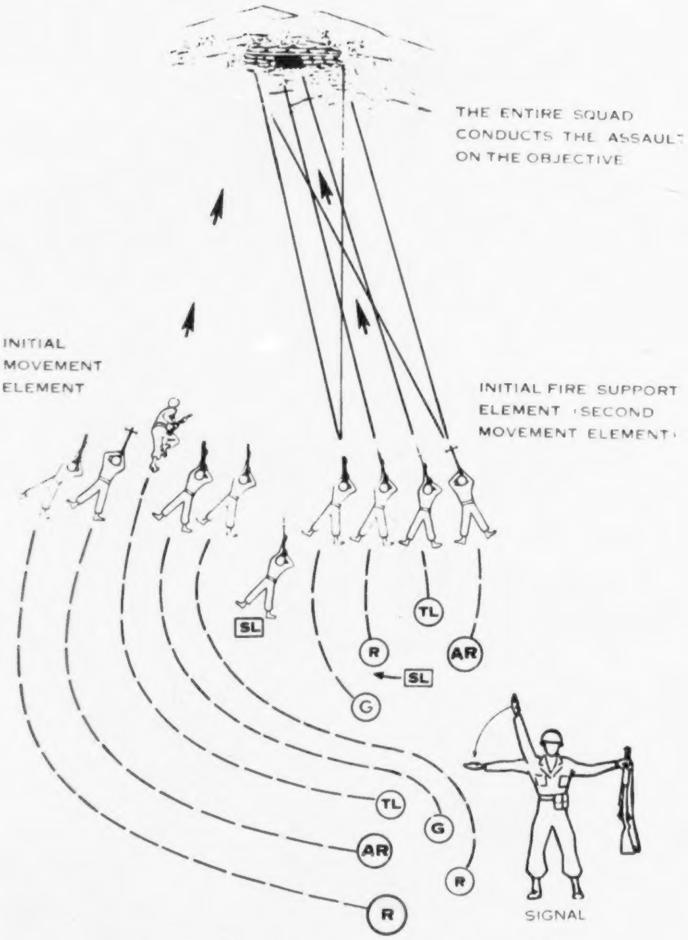

MANEUVER
ELEMENT
FIRE
SUPPORT
ELEMENT
SL
TL
R
AR
G
SL
TL
AR
G
R
R
SIGNAL - FIST
CLENCHED AND
THRUST IN
DIRECTION OF
MANEUVER

Figure 30. Maneuver right (left) from squad column, fire teams in column.

SQUAD BATTLE DRILLS

Drill. Squad battle drill includes squad fire and movement and squad fire and maneuver (maneuver left, right, and front). These maneuvers are executed from the squad formations.

Maneuver. The maneuver used in a particular situation is decided by the squad leader, based on his rapid estimate of the situation. He


THE ENTIRE SQUAD CONDUCTS THE ASSAULT ON THE OBJECTIVE
INITIAL MOVEMENT ELEMENT
INITIAL FIRE SUPPORT ELEMENT (SECOND MOVEMENT ELEMENT)
SL
TL
R
SL
AR
G
TL
G
AR
R
R
SIGNAL

NOTE MANEUVER FRONT IS USED TO FORM THE BASIC ASSAULT FORMATION (LINE) FROM THIS FORMATION INDIVIDUAL OR FIRE TEAM FIRE AND MOVEMENT MAY BE EMPLOYED PART OR ALL THE WAY TO THE OBJECTIVE THE EFFECTIVENESS OF ENEMY FIRES WILL DETERMINE THE METHOD OF ASSAULT USED

Figure 31. Maneuver front, left, right, from squad column, fire teams in column.

quickly considers such factors as the terrain (covered and concealed routes available for maneuver, and positions available for fire support), enemy dispositions and capabilities, his own dispositions, and the courses of action open to him. When the resistance is isolated and has exposed flanks, the squad leader attempts to move his maneuver element over a covered and concealed route to strike the enemy resistance in the flank or rear. When this is not possible, a frontal attack requiring fire and movement may be required.

Battle Drill from Squad Column (Fire Teams in Column). To execute maneuver right, maneuver left, or maneuver to the front, the squad leader gives the appropriate command and signal and the squad executes a maneuver similar to that in figures 30 (maneuver right or left) and 31.

BATTLE DRILL FROM SQUAD COLUMN (FIRE TEAMS ABREAST)

Battle Drill From Squad Column (Fire Teams Abreast). To execute maneuver right, maneuver left, or maneuver to the front, the squad leader gives the appropriate command and signal, and the squad

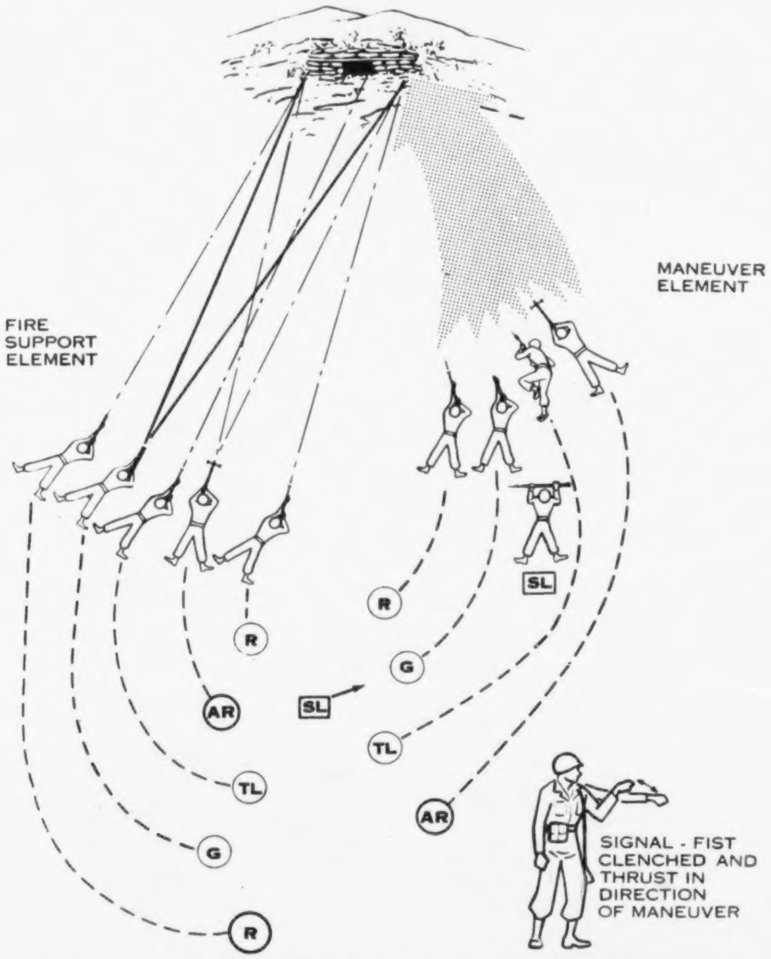

MANEUVER ELEMENT
FIRE SUPPORT ELEMENT
SL
R
R
G
AR
SL
TL
TL
AR
G
R
SIGNAL - FIST CLENCHED AND THRUST IN DIRECTION OF MANEUVER

Figure 32. Maneuver right, left, from squad column, fire teams abreast.

executes a maneuver similar to that in figures 32 (maneuver right or left) and 33.

Battle Drill From Other Squad Formations. Battle drill can be executed from the squad line formation in a manner similar to that depicted in maneuver front (fig. 31). The action executed will usually be fire and movement, since disengaging a fire team to maneuver to either flank will normally be very difficult.

Battle drill can be executed from the squad file formation in a manner similar to that depicted by fire teams abreast (figs. 32 and 33).

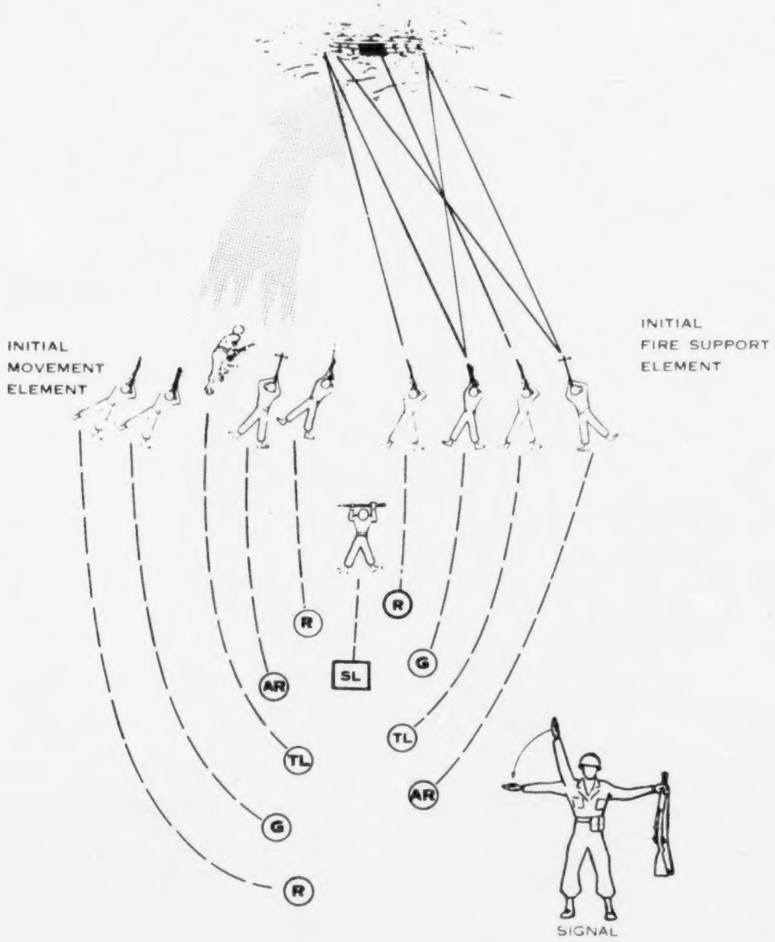

INITIAL
MOVEMENT
ELEMENT
INITIAL
FIRE SUPPORT
ELEMENT
R
R
AR
SL
G
TL
TL
AR
G
R
SIGNAL

Figure 33. Maneuver front, left (right), from squad column, fire teams abreast (fig. 31).

Rifle Squads. The rifle squad leaders, upon receiving a signal or order from the platoon leader, control their squads by signaling and commanding CHANGE DIRECTION, or FOLLOW ME, and set the example by moving in the desired direction. The squads move in formation under cover, or by fire and maneuver and/or movement, until they are able to take the enemy under effective fire. Here, they either form an assault line under supporting fires or execute squad battle drill.

Weapons Squad and Attached Crew-Served Weapons. The platoon leader must issue a fragmentary order to the platoon sergeant and weapons squad leader in order to most efficiently employ the organic and attached crew-served weapons. Normally, attached crew-served weapons are employed with the weapons squad. The platoon sergeant usually remains with the fire support element.

CHAPTER 5

PATROLLING

PROCEDURES

GENERAL

A patrol is a unit formed and sent out from a larger unit.

The commander provides for the security of his unit by employing patrols to prevent the enemy from surprising his unit, or he sends out patrols to gain and maintain contact with hostile or friendly units.

Effective use of well-trained patrols, whether in offensive or defensive operations, contributes to the combat effectiveness of a unit.

Patrols are classified by the type of mission they perform. The two general classifications of patrols are *reconnaissance* and *combat*. They differ in the mission assigned and their actions at the objective. A reconnaissance patrol is sent out to gather information and fights only to defend itself or to accomplish its mission. A combat patrol expects to fight in order to accomplish its mission. Some examples of combat patrol missions are to kill or capture enemy personnel or to destroy equipment and installations.

PREPARATION FOR PATROLS

Although the commander is responsible for the operation of patrols, the detailed planning of these operations is usually delegated to the operations officer (S3) and the intelligence officer (S2), who work together in planning a patrol action. The S2 prepares the daily patrol plan (fig. 34).

Included in the daily patrol plan are the missions and routes for all of the unit patrols for a particular day. The patrol plan is presented to the commander for approval or modification. When the commander approves the plan, the S2 or S3 notify the units that provide the patrols.

When a patrol mission is assigned, the designated patrol leader reports to receive an order. The commander's order covers the following points:

Mission.

Information about the enemy, terrain, and weather.

Location and planned activities of friendly troops (includes missions and routes of other patrols) and fire support available for the patrol.

Commander's concept of operation.

Time of departure and return.

General route.

Coordination with other patrols, supporting fires, security elements through which the patrol passes, and adjacent units.

Communications between the patrol and headquarters.

Special equipment provided or specialists attached to the patrol.

Reports.

Challenge and password.

Time and place for debriefing.

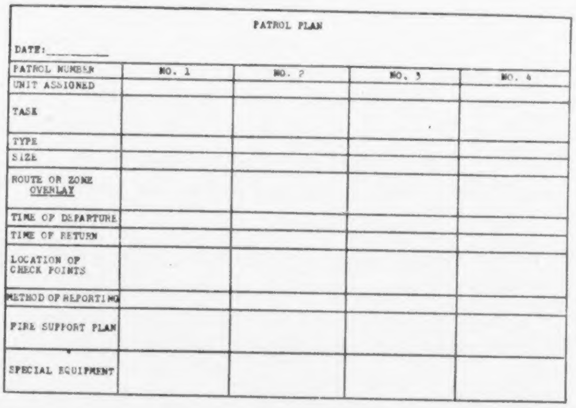
The commander insures that the information above is given to the patrol leader as early as possible to allow him maximum time to prepare for the patrol.

SELECTION OF THE PATROL LEADER

The commander selects a patrol leader with great care. A good patrol leader is aggressive though not rash, experienced in patrolling, and capable of making sound and quick decisions, a man who instills confidence in others and has a high degree of courage and physical stamina.

MISSIONS

The mission assigned a patrol is specific. Indefinite missions invite confusion, casualties, and failure. One patrol cannot execute efficiently a number of involved missions. It is preferable to employ a number of



PATROL PLAN

DATE:__________

PATROL NUMBER	NO. 1	NO. 2	NO. 3	NO. 4
UNIT ASSIGNED				
TASK				
TYPE				
SIZE				
ROUTE OR ZONE OVERLAY				
TIME OF DEPARTURE				
TIME OF RETURN				
LOCATION OF CHECK POINTS				
METHOD OF REPORTING				
FIRE SUPPORT PLAN				
SPECIAL EQUIPMENT				

Figure 34. A patrol plan.

patrols, each with a single mission. The patrol never abandons its mission if there is the least possibility of accomplishing even a part of it.

Size. The commander gives general guidance as to the size of the patrol. The patrol consists of the men and equipment necessary to accomplish the mission.

Time of Departure and Return. In making a decision on the time of departure and return of the patrol, the commander decides when he needs the information or when the mission must be accomplished. He considers how far the patrol has to go and how long it will take to accomplish the mission at the objective.

Coordination. If there are to be several patrols operating at the same time, the commander coordinates their actions by assigning general routes and checkpoints for each and informing the patrols of the missions and routes of the others. Coordination with higher, adjacent, and supporting units is effected by use of the daily patrol plan. Security elements through which the patrol passes in leaving and reentering friendly lines are notified of the time of departure and expected time of return, size of the patrol, and any special means of identification to be used by the patrol.

Communications. The commander equips the patrol with some means of communication (radio, telephone, or pyrotechnics) and may require periodic reports. The commander specifies the time to report, any code to be used, and who the patrol will contact.

Special Equipment and Specialists. The commander provides the patrol with any special equipment needed to accomplish the mission. This may include such items as sniperscopes and camouflage suits. Intelligence personnel, linguists, demolition experts, native guides, and other specialists may be attached. The commander allows maximum time available for the patrol leader to prepare his patrol.

Estimate of the Situation and Tentative Plan. On receipt of the order from the commander or his representative, the patrol leader begins to plan the operation. The first step in any operation is to plan the use of available time. He makes a map study and a plan. The plan includes the size of the patrol, selection of the members, special equipment needed, and other factors to be covered in the warning order to the patrol.

Warning Order. After completing his plan, the leader assembles his men and issues a warning order. This order is issued as early as possible to allow time for adequate preparation and includes:

A brief statement of the situation, both friendly and enemy.

Mission.

General instructions concerning rations, ammunition, and special equipment to allow the men to physically prepare for combat.

Individual's preparation for the patrol.
The chain of command.
A time and place for issuing the patrol order.

Preparation by the Second in Command. The second in command assists the patrol leader in preparing his plan so as to become familiar with every aspect of the mission in case the patrol leader becomes a casualty.

Reconnaissance. The leader makes a detailed map and visual reconnaissance of the area over which the patrol is to operate. It is necessary for the leader to choose the best available route. He selects an observation post where he can see the terrain and as much of the route as possible. An aerial reconnaissance is a great help. If the patrol is going out at night, the leader memorizes the key terrain features. If time permits, he studies the terrain at dusk and after dark.

Completing Detailed Plans. The patrol leader has received the patrol order, issued a warning order, and made a reconnaissance (if reconnaissance was possible). The patrol is preparing for the mission. The leader is now ready to plan in detail for the accomplishment of the mission.

Specific Duties of Elements, Teams, and Individuals. The warning order assigned tasks to elements, teams, and individuals. Now, *specific* duties are assigned to each. For example, where will each security team be positioned and what is its specific job?

Route and Alternate Route of Return.

a. The leader may be directed to follow a certain route; the mission may require it, or he may select his own. So far as his orders and mission permit, he selects routes avoiding known enemy positions and obstacles, offering the most cover and concealment, and permitting quiet movement. He takes advantage of the more difficult terrain.

b. He studies maps, aerial photos, or sketches and memorizes the route before starting. Distinctive features (hills, streams, swamps) and their location in relation to the route are noted.

c. While moving along the route, he observes the terrain, mentally checking off the distinctive features (noted in planning the route) to remain oriented at all times. Also, he—

(1) Avoids open areas.

(2) Avoids moving along ridges. Move along the slope below the ridge to prevent silhouetting yourself.

(3) Avoids obstacles which may be mined, boobytrapped, or covered by fire; for example, draws leading into enemy areas, ditches near enemy areas, wire entanglements, and road obstructions. Move around them if possible. If you must pass an obstacle, investigate it thoroughly.

d. You normally return by the same route. However, you must plan an alternate route of return to use if the patrol was detected on the way to the objective, or if you have reason to believe it was detected. The alternate route must be far enough away from the primary route so the same enemy detecting the patrol along the primary route will not detect it along the alternate route. At night these routes may be very close together because of limited visibility, but during daylight a greater distance between the two is required. The alternate route, just as the primary route, must be coordinated.

Conduct of the Patrol.

a. Plan carefully for every action the patrol will take.
Formation and order of movement.
Departure and reentry of friendly area(s).
Rallying points and actions at rallying points.
Actions on enemy contact.
Actions at danger areas.
Actions at objective.

b. Help the planned conduct of the patrol to succeed by carefully planning for inspections and rehearsals of all actions.

Arms and Ammunition. Check to see if the arms and ammunition specified in the warning order have been obtained. Were all items available? Are they adequate? The patrol must be informed if any changes are made.

Uniform and Equipment. Check to see if all desired equipment was available and was drawn. Is additional equipment needed? Do you need to modify the prescribed uniform? Make necessary changes *now* and inform the patrol.

Wounded and Prisoners. The unit may have an SOP for handling wounded and prisoners, or the patrol order may give instructions. If not, consider situations which may arise and plan for each.

Signals. Plan the signals to be used within the patrol. This includes arm-and-hand signals, pyrotechnic signals, and call signs for radios used to communicate within the patrol.

Communication With Higher Headquarters. What call signs will be used? What are the primary and alternate frequencies? When do you report? Will you use special code words or transmit in the clear? Remember to include all essential details of communications.

Challenge and Password. Be sure to include the current challenge and password. Don't forget to check for the challenge and password to be used within the patrol and outside of friendly areas.

Chain of Command. Is everyone assigned a place in the chain of command?

Location and Leaders. Where do you plan to be in the formation? Make it clear that you will move as the situation requires. Place the assistant patrol leader where he can best assist in control during movement. During actions at the objective, he must be positioned so he can readily take command if the leader becomes a casualty.

Final Coordination. The patrol leader's final plan may require him to contact the commanders supporting the patrol. If the plan includes fire support, he contacts the artillery or mortar representative to work out the detailed final plan. He checks to see if friendly outposts have been notified of the patrol. He asks for last minute information of the enemy. He arranges for any additional special equipment that he needs. Coordination is a continuous process.

Operation Order. The patrol operations order is given to all members of the patrol in a clear, concise, and forceful manner. The patrol members depend on the plan to successfully accomplish their mission; the leader gives his operation order all the thought and care that time allows. The order is given in operation order sequence and includes information that is of direct value to the patrol. When the complete order has been issued, the leader allows his men an opportunity to ask questions. He, in turn, questions the men to ascertain that all parts of the order are understood. An operation order basic format follows:

OPERATION ORDER

1. SITUATION
    - A. ENEMY FORCES.
        - (1) SITUATION (ENEMY, WEATHER, AND TERRAIN).
        - (2) CAPABILITIES.
        - (3) PROBABLE COURSE OF ACTION.
    - B. FRIENDLY FORCES.
        - (1) MISSION OF NEXT HIGHER UNIT.
        - (2) MISSION OF ADJACENT UNITS (LEFT, RIGHT, FRONT, REAR).
        - (3) MISSION AND LOCATION OF SUPPORTING ELEMENTS.
    - C. ATTACHMENTS AND DETACHMENTS.
2. MISSION. WHO, WHAT, WHEN, WHY, WHERE (COORDINATES)
3. EXECUTION
    - A. CONCEPT OF OPERATION.
        - (1) SCHEME OF MANEUVER.
            - (a) FORMATION
            - (b) ROUTE
            - (c) TACTICAL MISSIONS TO SUBORDINATE UNITS

(2) PLAN OF FIRE SUPPORT.
B. SUBUNIT SUBPARAGRAPHS.
C. COORDINATING INSTRUCTIONS.
4. SERVICE SUPPORT
A. SUPPLY.
(1) RATIONS.
(2) UNIFORM AND EQUIPMENT.
(3) ARMS AND AMMUNITION.
(4) CAPTURED MATERIEL.
B. TRANSPORTATION.
C. MEDICAL EVACUATION.
D. PERSONNEL.
E. PRISONERS OF WAR.
5. COMMAND AND SIGNAL
A. SIGNAL.
(1) FREQUENCIES AND CALL SIGNS.
(2) PYROTECHNICS AND SIGNALS.
(3) CHALLENGE AND PASSWORD.
(4) CODE WORDS.
B. COMMAND.
(1) COMMANDER LEADER LOCATION.
(2) CHAIN OF COMMAND.

Rehearsals. The patrol leader designates the time and place for rehearsals. They include control measures, security, action taken in the event of contact, actions at the objective, and withdrawal from the objective. The leader conducts as many rehearsals as time permits. A rehearsal points out omissions in the patrol leader's order and clarifies misunderstandings of the patrol members. Each succeeding rehearsal improves the performance and timing of the patrol and instills the feeling that the patrol is capable of accomplishing its mission.

CONDUCT OF THE PATROL

GENERAL

Patrolling is perhaps the most demanding of all small unit operations. It requires the soldier to exert the utmost in combat skill and resourcefulness. Until the patrol returns to its own lines, the safety and success of the patrol depend primarily on the judgment and training of the patrol leader and his men.

Just prior of leaving, the leader checks the physical condition of each member of the patrol, and their clothing and equipment for completeness and camouflage. He sees that each man has only the identification specified by the unit SOP or the commander.

LEAVING AND REENTERING FRIENDLY LINES

The intelligence officer or operations officer may coordinate with units in whose areas of responsibility the patrol is to operate. However, this does not relieve the patrol leader of the responsibility of notifying the specific unit through which the patrol departs and returns.

As the patrol leaves friendly lines, it is halted near the friendly position. The leader takes one man to contact the sentries and, if possible, their local leader. The sentry or unit leader orients the patrol leader on the latest information, direction and location of the enemy, known obstacles, and checks the correct challenge and password. The patrol leader informs the sentry or unit leader of the general route of the patrol and the time it expects to return. The patrol leader requests the sentry to notify his relief of the patrol's activity.

As the patrol returns to friendly positions, it does not relax its alertness and caution. All sentinels are regarded as enemy until proven otherwise. The patrol is halted as it nears the friendly sentries. The correct procedure in exchanging the challenge and password is used. When the sentry recognizes the patrol leader, the leader sends the man who accompanied him back to move the remainder of the patrol forward. As there may be more than one friendly security element, the sentry warns the others the patrol is returning. The patrol members approach in single file so the leader or the assistant patrol leader can look each man in the face and identify him as friendly. The leader or the assistant patrol leader then informs the sentry when the last man has passed. If a patrol member is missing, the patrol leader warns the sentries to remain alert for the missing individual.

LEADERS

The patrol leader locates himself where he can best control the patrol. This is usually near the head of the patrol during movement. His position in the formation varies from time to time but he remains where the patrol members can see or hear his signals. The second in command moves in a position from which he can best assist the patrol leader, or if necessary, take command of the patrol. This is usually near the rear of the formation.

INFILTRATION

There are times when large patrols are required. When this is the case, individuals or small groups may slip through gaps in the enemy defenses and reform on the other side. Care is exercised when moving through a gap in the enemy lines since it may be covered by enemy fire. When infiltration is necessary, the patrol leader designates a primary rendezvous point. An alternate rendezvous point is also designated and used in event the primary point is occupied by the enemy. Individuals or small groups then infiltrate over different routes at varied intervals. Upon arrival at the rendezvous point, the patrol members take up positions for all-round security and wait for the remaining members to assemble. Once the patrol is assembled, it continues on to accomplish the mission.

MOVEMENT

General. Consistent with security and silence, the patrol moves as quickly as possible. Security during the movement is furnished to a degree by the formation. In some situations, the patrol leader investigates dangerous areas or moves more men on the flank of the patrol.

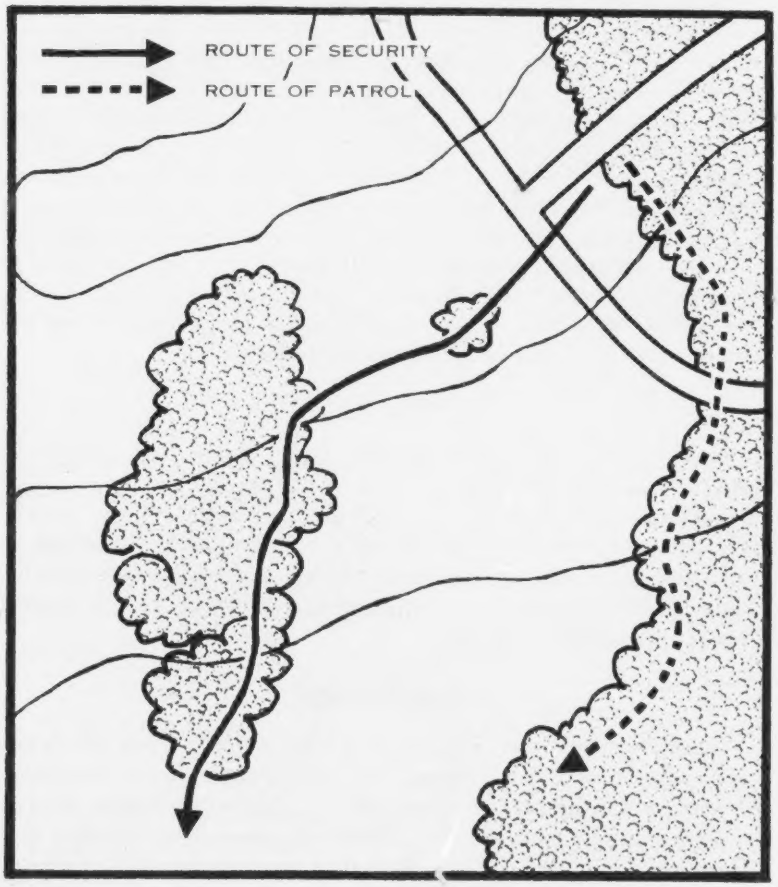


Figure 35. Route taken by two men providing flank security for daylight patrol.

55

Passing Through Woods. Before a patrol enters a woods, the leading men move into the near edge of the woods to reconnoiter while the remaining patrol members cover their advance. When the area is found clear, the leading men signal for the remainder of the patrol to move forward. In moving through the woods, a patrol avoids trails and game paths when possible. Clearings are bypassed. Upon reaching the far side, the patrol is halted and the terrain carefully examined to the front. The leader moves to a vantage point on the forward edge of the woods and determines the best route forward (fig. 35).

Passing Through a Village. The patrol does not enter a village unless required to do so. When it is necessary, a village is carefully reconnoitered before the patrol enters. Passing through a village, the patrol moves in a column formation with part of the patrol on each side of the street. At an intersection the leader halts the patrol and observes down the side streets. If all appears clear, the patrol then crosses the intersection rapidly; if it is not clear, the leader moves to the point and decides on the action to be taken.

AVOIDING AMBUSH

A patrol is always subject to ambush and must be alert to this possibility at all times. The security elements of the patrol are positioned in a manner to prevent the enemy from placing aimed fire on all members of the patrol at the same time. If the patrol is ambushed, the leader takes immediate action. The action is rapid and determined with the entire patrol assaulting the ambushing force in the most favorable direction. If the patrol is dispersed, members return to the last rallying point and reassemble.

HALTS

The patrol leader orders halts for short periods to allow his men to rest, check his direction, or for other reasons. The area selected in which to halt should offer cover and concealment. At night, the patrol halts on low ground so approaching individuals are silhouetted against the skyline. Security is maintained during halts by assigning sectors to observe and protect.

RECONNAISSANCE OF KEY POINT

Before reconnoitering a key point, the patrol leader observes it from a distance to try to determine if it is occupied by the enemy. The leader then studies the terrain and selects the best route forward, avoiding such places as houses, villages, and clumps of trees unless the mission requires him to approach or enter them. Two or more men, covered by the remainder of the patrol, reconnoiter the key point.

CROSSING A DANGER AREA

Before a patrol crosses a road, trail, open field, or other danger area, it is reconnoitered for some distance on each flank and both sides (fig. 36). When the leader is assured that no enemy is located in the area, the patrol crosses the road. During daylight hours the patrol may cross quickly and quietly in one rush in the line formation. During the hours of darkness the patrol normally crosses while maintaining formation and using stealth.

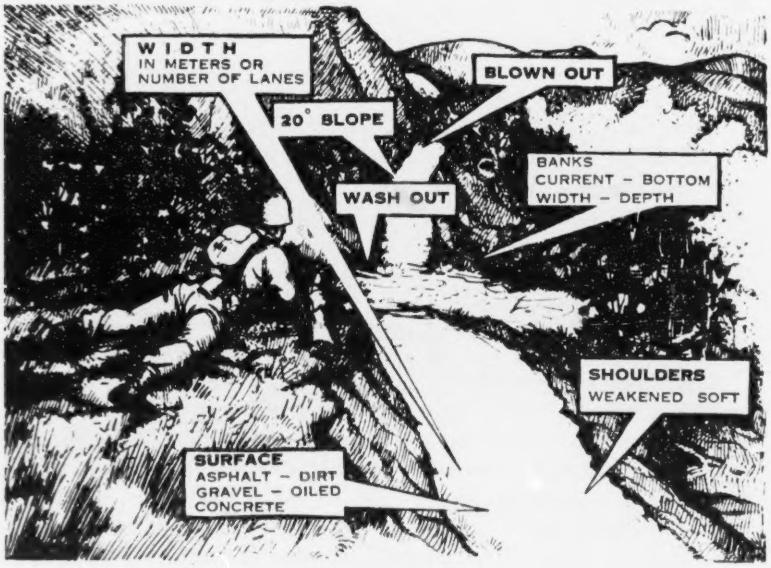

WIDTH
IN METERS OR
NUMBER OF LANES
20° SLOPE
BLOWN OUT
WASH OUT
BANKS
CURRENT – BOTTOM
WIDTH – DEPTH
SHOULDERS
WEAKENED SOFT
SURFACE
ASPHALT – DIRT
GRAVEL – OILED
CONCRETE

Figure 36. Points to be noted about roads.

RECONNAISSANCE PATROLS

MISSION

The primary mission of a reconnaissance patrol is to gather information. Reconnaissance patrols are assigned missions to determine enemy dispositions, enemy strength, enemy activities, and locations of weapons and facilities. They investigate such manmade obstacles as barbed wire entanglements, roadblocks, minefields, bridges, antitank ditches, and traps, and gain information about the terrain. The mission assigned the patrol may require the use of specialists such as engineer or intelligence personnel.

TYPES OF PATROLS AND PROCEDURES

There are two types of reconnaissance patrols:

Point Reconnaissance. A point reconnaissance patrol secures information of a specific location or small area, usually a known or suspected position or activity. This is done by reconnoitering the location or by maintaining surveillance over it.

Area Reconnaissance. An area reconnaissance patrol secures information of an extended area or of several locations within an area. This is accomplished by maintaining surveillance over the area or by making coordinated point reconnaissance of designated locations within the area.

Size and Composition. The minimum size of a reconnaissance patrol is two men. There is no maximum. Above the minimum of two men, size is determined by the mission to be accomplished. Generally, reconnaissance patrols are organized into two elements: A security element and a reconnaissance element. The patrol headquarters is usually included as part of the reconnaissance element of a point reconnaissance patrol. An area reconnaissance mission may reqiure the headquarters to be a separate element.

Operation. A reconnaissance patrol tries to reach its objective and accomplish its mission without being discovered. If it encounters an enemy position or outpost while moving to its objective, it attempts to withdraw and go around it. The patrol engages in combat only to accomplish its mission or to protect itself. The commander tells the patrol leader if he expects it to have to fight to accomplish its mission.

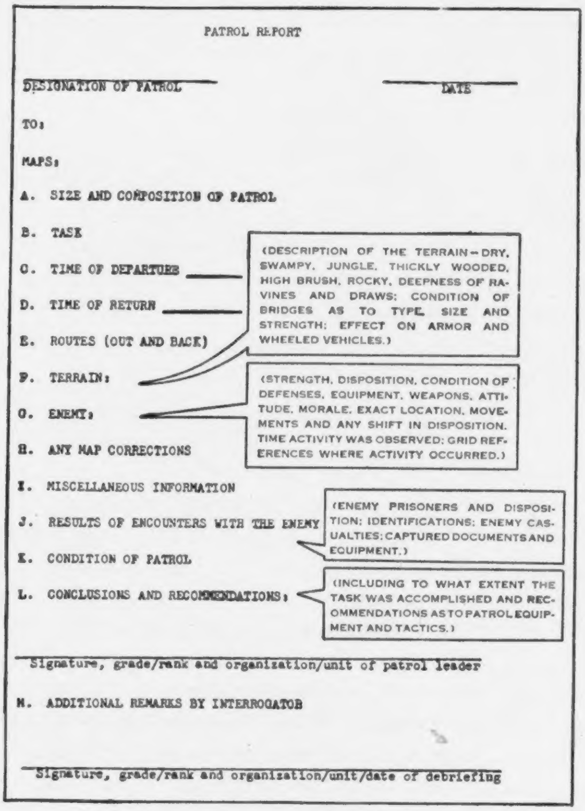
Actions of the Objective. The actions on point and area reconnaissance areas follow:

Point Reconnaissance. The patrol is halted and concealed near the objective, usually at the objective rallying point. The leader reconnoiters to confirm the location of the objective. Security teams are positioned so that they can secure the objective rallying point, provide early warning of enemy approach, protect the reconnaisance element, or any combination of these tasks. The reconnaissance element then reconnoiters the objective. When the reconnaissance is completed, all information gained is disseminated to all patrol members.

Area Reconnaissance. The leaders' reconnaissance is conducted, security teams positioned, and reconnaissance teams sent out as in a point reconnaissance mission. When the entire patrol is used to reconnoiter the area, each team is a reconnaissance and security team, providing its own security. When teams are not to return to the objective rallying point, they assemble at a rendezvous point such as a patrol uses to assemble after infiltration or exfiltration. This method of assembly might be used when teams must avoid moving through an area twice or when the objective is approached from the rear.

Information Reported. During the conduct of the patrol, the patrol leader requires the members of his patrol to signal or report all positive and negative information and to report to him immediately any unusual or suspicious occurrences they observe or hear. He records all important information and keeps the other patrol members informed of the situation. A prearranged code can be used but the same code is not used for more than one mission. When making a detailed reconnaissance of an enemy position, the radio is kept well to the rear.

Debriefing. Immediately upon return to its unit, the entire patrol reports for debriefing to the officer who sent the patrol out. The leader and all members of the patrol are questioned in detail on all aspects of the operation. A complete and accurate patrol report (fig. 37) is compiled from the results of the debriefing.



PATROL REPORT

DESIGNATION OF PATROL ________ ________ DATE

TO:

MAPS:

A. SIZE AND COMPOSITION OF PATROL

B. TASK

C. TIME OF DEPARTURE ________

D. TIME OF RETURN ________

E. ROUTES (OUT AND BACK)

F. TERRAIN:

(DESCRIPTION OF THE TERRAIN—DRY, SWAMPY, JUNGLE, THICKLY WOODED, HIGH BRUSH, ROCKY, DEEPNESS OF RAVINES AND DRAWS; CONDITION OF BRIDGES AS TO TYPE, SIZE AND STRENGTH; EFFECT ON ARMOR AND WHEELED VEHICLES.)

G. ENEMY:

(STRENGTH, DISPOSITION, CONDITION OF DEFENSES, EQUIPMENT, WEAPONS, ATTITUDE, MORALE, EXACT LOCATION, MOVEMENTS AND ANY SHIFT IN DISPOSITION. TIME ACTIVITY WAS OBSERVED; GRID REFERENCES WHERE ACTIVITY OCCURRED.)

H. ANY MAP CORRECTIONS

I. MISCELLANEOUS INFORMATION

J. RESULTS OF ENCOUNTERS WITH THE ENEMY

(ENEMY PRISONERS AND DISPOSITION; IDENTIFICATIONS; ENEMY CASUALTIES; CAPTURED DOCUMENTS AND EQUIPMENT.)

K. CONDITION OF PATROL

L. CONCLUSIONS AND RECOMMENDATIONS:

(INCLUDING TO WHAT EXTENT THE TASK WAS ACCOMPLISHED AND RECOMMENDATIONS AS TO PATROL EQUIPMENT AND TACTICS.)

____
Signature, grade/rank and organization/unit of patrol leader

M. ADDITIONAL REMARKS BY INTERROGATOR

____
Signature, grade/rank and organization/unit/date of debriefing

Figure 37. Patrol report form.

COMBAT PATROLS

MISSIONS

A combat patrol expects to fight to accomplish its mission. Typical missions include capturing or destroying enemy personnel, important installations, and supply points; occupying key terrain; or providing security. A combat patrol gathers incidental information of the terrain and of the enemy while executing its primary mission.

A combat patrol gets its name from its specific mission. If its mission is a raid, the patrol is called a raid patrol. If it sets up an ambush, it is called an ambush patrol. Missions such as security, contact, and economy-of-force actions (minimum personnel with a limited objective) are other types of combat patrols.

COMPOSITION

The size of a combat patrol depends on the mission and expected enemy action. It varies from a two-man tank-hunter patrol to a company or larger unit. Large combat patrols are usually employed to raid enemy installations, to establish patrol bases, or to conduct security operations. Whenever possible, squads and platoons are used as combat patrols under their own leaders because they are accustomed to fighting together. Most combat patrols are organized into three main elements: assault element, support element, and security element. The assault element is used to eliminate enemy security and accomplish the mission; the security element is used to isolate the objective area in order to prevent enemy reinforcement or escape, cover the withdrawal of the assault element, and provide security for the entire patrol; the support element supports the assault by fire.

EQUIPMENT

Patrol members carry their individual weapons, sufficient hand grenades, and ammunition. As with reconnaissance patrols, combat patrols are equipped with adequate compasses, wristwatches, communications, and at least two pairs of fieldglasses. To increase firepower, the patrol members may substitute automatic weapons for semiautomatic weapons. For certain missions, the patrol may need additional items of equipment; for example, to destroy enemy weapon emplacements, an enemy command post, or a bridge, demolitions and thermite grenades are needed. For some raids and ambushes, mortars and recoilless rifles are required.

The use of scout dogs and infrared equipment is especially suited to a combat patrol. The scout dogs find the enemy and the sniperscope pinpoints him for the kill.

Combat patrols are provided communications to maintain contact with the commander; if it is a large patrol, it needs radios for communication between its elements.

RAIDS

General. A raid is a surprise attack upon an enemy installation with the attacking forces withdrawing after accomplishing their mission. Surprise, the key to success in the conduct of a raid, is achieved by attacking when the enemy least expects it. This is during periods of poor visibility such as darkness, rain, fog, or snow, and over terrain considered impassable by the enemy.

Missions for Raid Patrols. Typical missions assigned a raid patrol include capture of enemy prisoners or material, destruction of enemy weapons and equipment, and destruction of enemy personnel and installations such as command posts, communication centers, and supply installations. Raid patrols are sometimes used to force the enemy to disclose his positions.

Composition. The size of a raid patrol varies from a squad to a reinforced rifle company or larger unit depending on the mission. Unit integrity is maintained whenever possible so that squads and platoons fight as a unit. Specialists such as artillery forward observers, engineers, or intelligence personnel may be attached to raiding patrols. Raid patrols are organized into four principal elements: a headquarters element, a security element, a support element, and an assault element. The mission of the security element is to isolate the objective area by sealing off the approaches. Isolating the objective area prevents reinforcement and prevents the enemy within the objective from escaping. The assault element and the support elements are the forces that destroy the objective, either physically or by fire. They are organized for the specific task at hand.

Actions at the Objective. The security element, upon arrival at the objective area, moves to occupy positions where all approaches into the objective area can be covered by fire. While moving into position, the element is careful not to alert the enemy. This element may be divided into several teams. These teams must have communication with each other and the patrol leader. As the assault element moves into position, the security element informs the patrol leader of all enemy action, firing only when surprise is lost or when ordered to fire. Early warning is of primary importance as the patrol leader may desire to take positive action. Once the assault element has begun its action, the primary mission of the security element is to prevent enemy reinforcement and kill or capture any enemy personnel attempting to escape from the area. The security element withdraws to the rallying point on command of the patrol leader or upon prearranged signal.

The assault element is organized to do a specific job. Any part of a patrol engaging the enemy at the objective by fire or maneuver is part of the assault element. The patrol leader places himself in a position to control the actions of this element. When approaching the objective area, the patrol leader deploys the assult element far enough in advance to permit an immediate assult if they are detected by the enemy on the objective. Using stealth, the element then moves as close to the objective as possible to insure success. On command, or if fired upon, the assault element will quickly assault through the objective, using surprise and firepower to overcome the enemy. After the mission is completed, all elements of the patrol move quickly to the designated rallying point where they reorganize rapidly and move away from the area.

Sometimes raid patrols lose surprise when attacking an objective. In such a case, part of the assault element works in conjunction with the security element to act as a covering force to further isolate the objective and to engage the enemy. The remainder of the assault element then accomplishes the mission. A heavy volume of fire that produces a shock effect upon the enemy and prevents him from taking measures against the patrol is needed in a suitation of this type.

Rehearsals. The actions of a raid patrol at the objective area are very detailed in most cases and require a great deal of planning and coordination. Every individual must know his job exactly. Rehearsals provide the best means of insuring that patrol members become acquainted with their tasks. Select terrain similar to that over which the patrol is to operate, represent the objective as closely as possible, and conduct rehearsals until each member is thoroughly familiar with his job and those of other members.

AMBUSH

General. An ambush is a surprise attack upon a moving or temporarily halted enemy. The object is to capture or destroy the entire enemy force. Again, surprise is the key to success. Best results are obtained by ambush patrols sent deep behind enemy lines where the enemy's security is lax. There are three types of ambush:

A *point ambush* is one where forces are deployed to support the attack of a single killing zone.

An *area ambush* is one where forces are deployed as multiple *related* point ambushes.

The *hasty ambush* is an immediate action procedure that is employed when chance contact with the enemy is made during patrol movement. When a special silent signal is given by the point, patrol leader, or another authorized man, the entire patrol moves quickly to the right or left of the line of movement as indicated by the signal and takes up the best available concealed firing positions. The patrol leader initiates the ambush by firing his weapon and shouting "fire." This insures initiation should his weapon misfire.

Missions for an Ambush Patrol. Ambush patrols perform their missions against such groups as enemy carrying parties, patrols, wire repair crews, enemy reconnaissance patrols, sentinels moving to their outpost position, and vehicles and foot elements. Successful ambush patrols require a specific mission based on detailed knowledge of the enemy, not general-type missions.

Equipment. Equipment carried by ambush patrols varies with each mission. Since the success of this type patrol depends largely upon surprise and shock action, sufficient automatic weapons are needed to deliver a heavy volume of fire. This is especially true when ambushing foot elements. In addition to automatic weapons, vehicular targets require rifle grenades, rocket launchers, antitank and antipersonnel mines, demolitions, and other materials used to destroy or stop vehicles. Wire or field phones are useful in maintaining control.

Factors Necessary for a Successful Ambush. There are certain factors peculiar to an ambush that are considered essential to successful execution. They are:

Patience. Since an ambush patrol may wait in position several hours before action, troops participating must be able to exercise patience.

Camouflage discipline. The key to a successful ambush is surprise. Surprise cannot be achieved if strict camouflage discipline is not enforced.

A good plan, well rehearsed. The enemy's movements must be anticipated when planning an ambush. Once this is done, rehearsals are conducted so each individual knows his part.

Prior knowledge of the enemy. This is considered essential. The mission assigned an ambush patrol is based upon detailed information of the enemy; for example, how much security the enemy uses in movement, how he operates, the size of your particular objective, and the time the enemy passes certain points or areas. This information plays an important part in planning.

Organization. Like a raid, an ambush patrol is organized into four principal elements: a headquarters element, a support element, a security element, and an assault element. The security element has the mission of protecting the rear and flanks of the assault element. It is placed in position to prevent the assault element from being surprised, to seal off the avenues of approach into the objective area, and to cover the withdrawal of the assault element out of the objective area. The security element does not participate in the initial attack. Once the action by the assault element has started, it is essential that the security element prevents the enemy from reinforcing the objective. The security withdraws on command of the patrol leader or upon a prearranged signal. The support element has the mission of placing an initial heavy volume of fire into the killing zone, supporting by fire the assault and, if necessary, the withdrawal of the assault element from the killing zone. The element is placed to produce maximum effective fire in the killing zone and, when possible, enfilade fire through the length of the killing zone. Weapons carried by the support element, in addition to a preponderance of automatic weapons, may include grenade launchers, mortars, rocket launchers, or flamethrowers. Accurate, rapid, surprise fire is essential to produce shock effect on the enemy. The assault element is the force which closes with and captures or destroys the enemy. The patrol leader places himself with the assault element where he can best control the action. When the ambush is set off, the assault element, along with the support element, produces a high volume of surprise fire, then upon command of the patrol leader, it physically moves into the killing zone and insures destruction of vehicles and material, searches enemy dead, takes prisoners, or accomplishes any other duties assigned by the patrol leader as required by the mission. Having completed this action at the objective the assault element, followed by the support element, withdraws to a nearby rendezvous point which is out of range of small arms fire from the ambush site. The security element is withdrawn last after all other personnel have departed the ambush positions. Reorganization and movement from the rendezvous point proceed as rapidly as possible.

If the selected ambush site does not have natural obstacles to restrict the enemy's movement to at least one flank, an obstacle must be constructed. Antipersonnel mines, antitank mines, and tangled wire are excellent materials to use. Artificial obstacles are placed so the enemy cannot easily recognize them.

Obstacles are located along roads, in a defile, in woods, or on a steep grade to force vehicles to slow down or halt. Mines and demolitions are especially suitable for use in constructing obstacles. The fires of suitable weapons are directed to knock out the first and last vehicles, then all fires are concentrated on the other vehicles in the column.

Searching for Snipers. When searching terrain for snipers, the patrol operates in two-man teams. Two teams often work together, one moving while the other provides cover. The searchers must keep concealed since the enemy may have several positions, each supporting the other by fire. The patrol searches its assigned area thoroughly, paying particular attention to trees. When an enemy sniper is located, one team holds his attention while the other closes in from the flank or rear.

CHAPTER 6

TECHNIQUE OF FIRE OF THE RIFLE SQUAD

INTRODUCTION

GENERAL

Success in combat depends in large measure upon a unit's ability to apply and control its fires. A fire unit is a unit whose fire in combat is under the immediate and effective control of its leader. The *rifle squad* is the *basic fire* unit of the infantry. Around the rifle squad revolves the entire infantry organization. All military effort succeeds or fails, depending upon the the performance of the rifle squad. Rifle squad members must be trained as effective teams in the application and control of their collective fires.

ORGANIZATION OF THE RIFLE SQUAD

The rifle squad consists of the squad leader and two fire teams, the ALFA team and the BRAVO team. The ALFA team consists of a team leader, one automatic rifleman, one grenadier, and one rifleman. The BRAVO team is organized the same, except it has one additional rifleman.

Squad Leader. The squad leader is responsible for all that the squad does or fails to do. In combat, some of his responsibilities are fire discipline, fire control, and maneuver of his squad. He positions himself where he can best carry out the orders of the platoon leader and observe and control the squad.

Fire Team Leader. The fire team leader carries out the orders of the squad leader for the employment of his fire team to include its fire discipline and fire control. He positions himself where he can best carry out the orders of the squad leader in controlling the fire team. He should be close enough to the automatic rifleman and grenadier to enable him to exercise effective control over them. He also acts as a rifleman.

Automatic Riflemen, Grenadiers, and Riflemen. The automatic riflemen, grenadiers, and riflemen are responsible for effective engagement of various targets using prescribed SOPs and techniques. They keep alert for orders from the squad and team leaders and transmit orders from them to other squad members. The riflemen assist the automatic riflemen and grenadiers in adjusting fire on targets when the situation permits. The riflemen must be prepared to take the place of any of the automatic riflemen or grenadiers who become casualties.

Platoon Leader. The rifle platoon leader is responsible for the training and the effective employment of his rifle squads in combat. He must therefore insure that the rifle squads are well trained in technique of fire and that the rifle squads' proficiency in technique of fire is maintained.

Training. Training in technique of fire is integrated with rifle squad tactics and frequently follows marksmanship instruction and range firing. It should be integrated in all tactical exercises whenever possible. Unless a soldier knows the techniques of applying his fires as a member of a rifle squad, he and his squad cannot perform their tasks effectively.

FUNDAMENTALS OF TECHNIQUE OF FIRE (DAY)

GENERAL

The rifle squad members must gain and maintain a high degree of proficiency in the fundamentals of technique of fire, including range determination, characteristics of fire, application of fire, and fire control. Proficiency in these fundamentals is developed and maintained by classroom instruction and live fire exercises.

RANGE DETERMINATION

All squad members must be able to determine range in order to effectively engage combat targets, to accurately shift fire, and to receive and give accurate fire commands. They use the 100-meter unit of measure and appearance-of-objects methods to determine range.

The 100-Meter Unit of Measure. To use this method, the rifleman must be able to visualize a 100-meter distance on the ground. With this unit in mind, he can mentally determine how many of these 100-meter units are between his position and the target. For ranges less than 1,000 meters and more than 500 meters a halfway point is selected, the range of the halfway point determined, and then doubled.

Appearance of Objects. Topography and vegetation conditions will make it impossible at times to observe most of the terrain to the target. In this case it is impractical to apply the 100-meter unit of measure, and therefore ranges must be determined by the appearance-of-objects method; that is, by knowing from practice the size of certain objects at 100 meters and at greater distances. For example, the rifleman studies the appearance of a man standing 100 meters away. He fixes his appearance firmly in his mind—his size and the details of his uniform and equipment. Next, he studies the man in the kneeling position, then in the prone position. By comparing the appearance of the man in these positions at known ranges from 100 to 500 meters, he can establish a series of mental images which allow him to determine ranges.

Factors Affecting Range Determination. Light and atmospheric conditions, positions of the observer and the target, and the nature of the terrain may cause an object to appear nearer or more distant than it actually is.

Lateral Distance Measurement. The squad members need a quick method of measuring the distance right or left from a reference point to a target, or of measuring the width of a linear target. They do this by finger measurement. This is not a method of range determination, but a method of determining the lateral distance in fingers between two points. Here is the way finger measurement is applied: extend the arm, palm to the front, and lock the elbow. Close one eye and sight along the edge of the index finger, placing this edge on the flank of a target or on a reference point. Note where the opposite side of the finger strikes the target or the ground. This is one finger measurement. If the breadth of one finger does not fill the space between the reference point and the target, hold up as many fingers as are needed to do so.

CHARACTERISTICS OF FIRE

The squad members must have a knowledge of the characteristics of fire of the weapons in order to apply their fires to the best possible advantage.

Trajectory. This is the path of the projectile in its flight from the muzzle of the weapon to the point of impact:

Rifle and automatic rifle. At ranges out to 300 meters, the trajectory of rifle and automatic rifle fire is almost flat. At greater ranges, it is necessary for the firer to adjust his point of aim, thus raising the height of the trajectory.

Grenade launcher. The grenade launcher is characterized by a high angle of fire or high trajectory. The trajectory of grenade launcher fire is quite different from that of the rifle or automatic rifle. The muzzle velocity of the grenade launcher is relatively slow when compared to that of the rifle. However, this muzzle velocity is sufficient to permit flat trajectory fire out to 150 meters. When engaging targets within this range, the weapon is aimed and in a manner similar to the rifle. When engaging targets at greater ranges, the angle of elevation must be increased. At the maximum effective range of the launcher (350

67

meters), the muzzle of the weapon is approximately 20° above the horizontal. This results in a relatively high trajectory and increases the time of flight of the projectile to the target. Since the trajectory is high and the time of flight long at ranges beyond 150 meters, wind will have considerable effect upon the projectile. The grenadier must allow for this.

Danger Space. This is the space between the firer and the target where the trajectory does not rise above the height of an average standing man, and the area of the beaten zone. A high velocity bullet fired from the prone position over level or uniformly sloping terrain at a target less than 700 meters away will not rise above the height of an average man. Anyone standing along this line of fire would be hit by the bullet. Therefore, this entire distance is danger space.

When firing at targets at ranges greater than 700 meters, the trajectory will rise above the height of an average standing man. Therefore, not all the distance between firer and target is danger space.

Cone of Fire. Successive projectiles fired from the same weapon at the same target take a slightly different path through the air. These differences are caused by small variations in the individual's aiming and holding of the weapon, ammunition, and atmospheric conditions. The pattern formed by these multiple projectiles in their flight through the air is called the cone of fire.

Beaten Zone. The area where the cone of fire strikes the ground or target is called the beaten zone. On uniformly sloping or level terrain, the beaten zone is elliptical (long and narrow) in shape. If the ground slopes downward, the beaten zone will become longer. When fires are delivered into rising ground the beaten zone will be shorter. As the range to the target increases out to 500 meters, the beaten zone will become longer and wider. Beyond 500 meters the beaten zone will become shorter and wider. An understanding of the beaten zone helps the squad members to get the best effect from their fires.

Casualty Radius. When high explosive projectiles are fired they produce casualties by fragmentation and concussion. The area around the point of impact of the projectile, where exposed personnel would be killed or injured, is called the casualty radius. The 40-mm, high explosive, projectile fired by the grenade launcher has an effective casualty radius of 5 meters.

Classes of Fire. Rifle and automatic rifle fire are classified with respect to the ground and the target.

Fire with respect to the target is—

Frontal when delivered at a right angle to the front of the target.

Flanking when delivered into the flank of the target.

Oblique when the long axis of the beaten zone is at an oblique to the long axis of the target.

Enfilade when the long axis of the beaten zone coincides with the long axis of the target. This type of fire is either frontal or flanking and is the most desirable type of fire with respect to the target because it makes maximum use of the beaten zone.

Fire with respect to the ground is—

Grazing when the height of the trajectory or the center of the cone of fire does not rise more than 1 meter above the ground. On uniformly sloping or level terrain, grazing fire can be obtained to a range of 600 meters with the rifles and automatic rifles. As the height of the trajectory increases or as the terrain varies, the amount of grazing fire will decrease.

Plunging when the angle of fall of the bullets with respect to the slope of the ground is such that the danger space is practically confined to the point of impact (beaten zone). Plunging fire is obtained when firing at long ranges, when firing from high ground to low ground, and when firing into abruptly rising ground.

APPLICATION OF FIRE

Squad Sector of Fire. In a defensive situation, the platoon leader assigns each of the squads a squad sector of fire. The squad leader must insure that all portions of his squad sector of fire are completely observed by the squad members. He does this by assigning each squad member an individual sector of fire. The individual squad member is responsible for visual observation and engagement of targets appearing in his sector of fire. The rifleman's sector of fire is approximately one-third of the squad sector of fire corresponding to his position in the squad. The automatic riflemen and the grenadiers are assigned the entire squad sector of fire or as much of it as possible. Primary targets for grenadiers and automatic riflemen are enemy automatic weapons anywhere in the squad sector of fire. Each team leader's sector of fire is approximately one-half of the squad sector of fire.

Types of Targets. Targets presented to the rifle squad during combat, with few exceptions, will consist of enemy personnel in various formations or in prepared positions. The fires applied to these targets are designed to thoroughly cover the area in which the enemy is known or suspected to be located.

Linear targets have more width than depth.

Column targets have more depth than width.

Point targets are targets which require the use of a single aiming point and are confined to a small area. Enemy bunkers, weapon emplacements, observation posts, vehicles, and small groups of personnel are considered point targets.

Area targets are almost equal in width and depth.

Application of Fire on a Linear Target. The squad leader designates the center and flanks of a linear target unless the target is obvious to the squad. Each fire team normally covers half of the squad target unless terrain or other factors dictate that one team cover a larger portion.

Riflemen. The riflemen fire initially at known or suspected targets in that portion of the target corresponding to their position in the squad (fig. 38). After all known enemy personnel in their portion of the target are eliminated, they fire at known or suspected enemy anywhere within their team target.

Automatic riflemen. In the absence of enemy automatic weapons the automatic riflemen engage the target as prescribed by SOP. A good technique is to have the automatic riflemen begin firing on the center of the squad target, insuring that their fires overlap (fig. 39). When the range to the target is 460 meters or less, they fire in short, accurate bursts (two or three rounds), distributing their fire from the center across their respective team targets to just outside the known flanks. They then return their fires to the center in the same manner. After fire superiority has been gained, the automatic riflemen fire at known or suspected enemy anywhere within their team target, or other targets as directed.

Grenadiers. In the absence of enemy automatic weapons the grenadiers engage the target as prescribed by SOP. A good technique is to have the grenadiers initiate their fires just outside the known flank of their respective team target (fig. 39). Firing as rapidly as possible, they distribute their fire across the team target, overlapping their fire at the center of the squad target. They then return to the flanks in the same manner. After fire superiority has been gained, the grenadiers fire at known enemy within their team target as directed.

Team leaders. The team leaders distribute their fire on the team target where they feel it will be the most effective (fig. 39). The team leaders make frequent checks with the squad leader for signals and instructions. They are also responsible for adjusting their teams' fire or shifting it, if necessary, to any portion of the squad target.

Application of Fire on a Column Target. Unless the target is obvious, the squad leader designates its center, front, and rear.

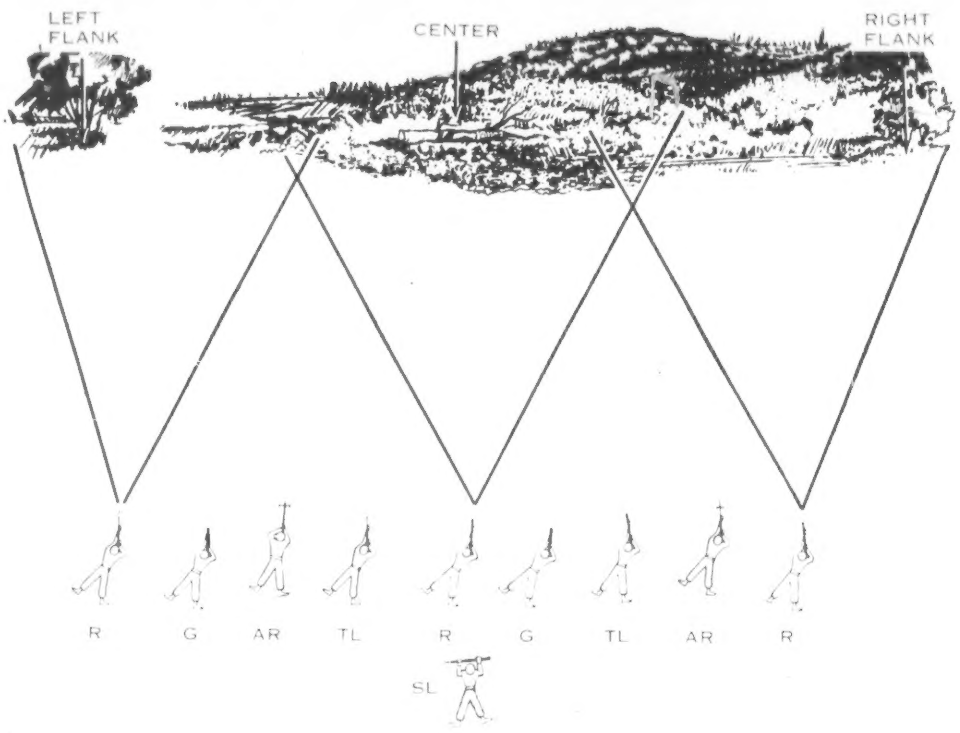

LEFT FLANK
CENTER
RIGHT FLANK
R
G
AR
TL
R
G
TL
AR
R
SL

Figure 38. Application of fire by the riflemen on a linear target.

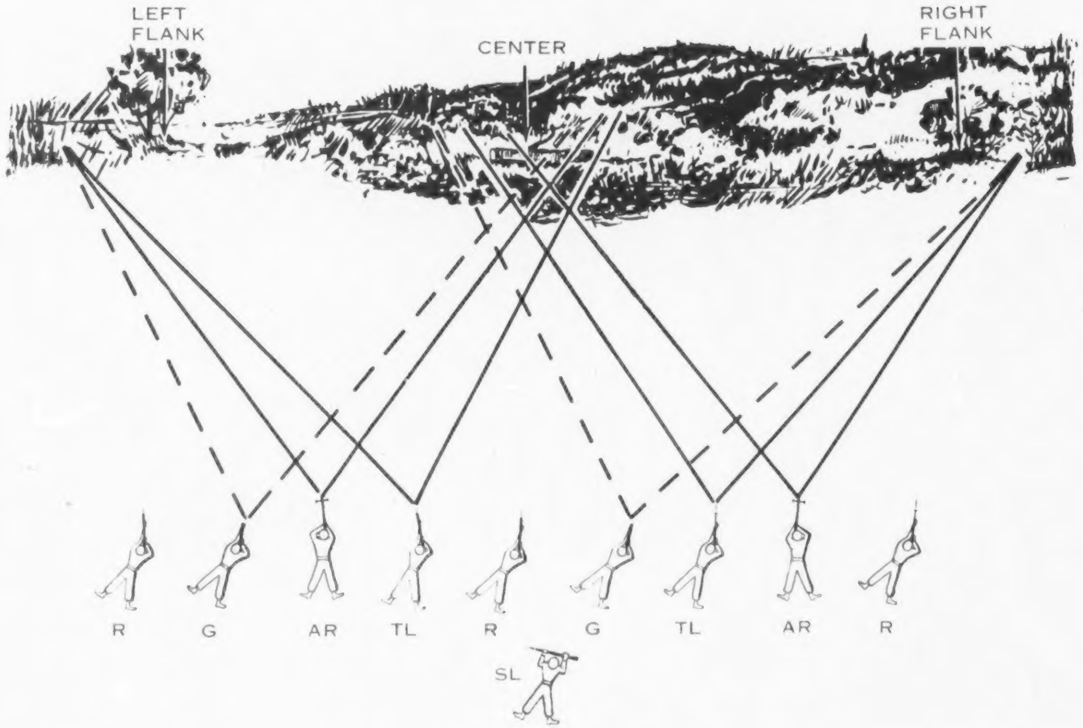

LEFT FLANK
CENTER
RIGHT FLANK
R
G
AR
TL
R
G
TL
AR
R
SL

Figure 39. Application of fire by the automatic riflemen, grenadiers, and team leaders on a linear target.

Each rifleman fires on that one-third of the target corresponding to his position in the squad.

The grenadiers and the automatic riflemen are initially at the center of the column target. If the enemy column changes formation or disperses, the automatic riflemen and grenadiers distribute their fire as directed by the team or squad leader. The fires of the grenadier are closely controlled to conserve ammunition.

The team leader of one team fires at targets in the front half of the target and the other team leader fires on the rear half.

Application of Fire on a Point Target. Point targets may be engaged by all or any combination of weapons in the squad at the discretion of the squad leader.

The automatic riflemen fire semiautomatically when engaging point targets such as windows, bunker apertures, or other targets which require pinpoint accuracy. When engaging any type point target beyond 460 meters, semiautomatic fire is used. Automatic fire is used when firing at larger point targets such as crew-served weapons or groups of personnel. The automatic riflemen fire simultaneously when a heavy volume of fire is needed. The automatic riflemen alternate their fire when it is necessary to engage a target for long periods. Alternating fire allows adjustment of fire, continuous delivery of fire on the target, and insures continued operation of the automatic rifles.

The grenadiers fire at all types of point targets out to 150 meters. From 150 to 350 meters, grenadiers can effectively engage only those targets that can be destroyed or neutralized with area fire, i.e., open, weapon positions, or small groups of personnel.

Application of Fire on Area Targets. The techniques used for engaging an area target are the same as for the linear target except that the fires of the squad members must also be distributed in depth, and the automatic riflemen use automatic fire at any range.

Rate of Fire. The maximum effective rate at which a squad member can fire is determined by how fast he can take a sight picture, properly control the trigger, and reload his weapon. The sustained rate of fire is that rate which can be maintained indefinitely without danger to the firer or damage to the weapon. The squad members fire their first few rounds, particularly in the case of surprise fire, at the maximum effective rate in order to gain fire superiority. Thereafter, the rate is reduced to the point that will maintain fire superiority. This reduction is necessary to insure continued operation of the weapons and ammunition conservation.

Assault Fire. Assault fire is delivered by the rifle squad during the final phase of an attack (fig. 40).

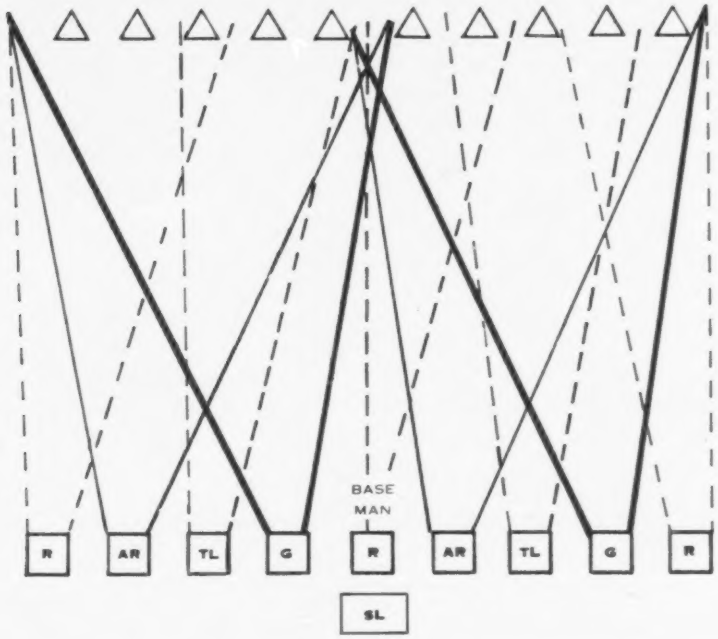


Figure 40. Chart showing distribution of fire in a night assault.

FIRE AND MANEUVER

There will be times when the squad must advance employing one part of the squad as a *fire support element* and the other part of the squad as the *maneuver element.* The fires of the fire support element must be distributed over the entire squad objective when the maneuver element ceases firing just prior to moving forward. The fire support element should also increase its rate of fire to compensate for the loss of the fires of the maneuver element.

FIRE CONTROL

The rifle squad's fires must be correctly applied and effectively controlled. Fire control depends on the ability of the squad to move from one firing position to another and to open fire, shift fire, and cease fire. In order to do this, the squad members must be able to put into practice all of the methods of fire control and develop teamwork.

Methods of Fire Control. There are several methods of controlling squad fires. The noise and confusion of battle will limit the use of

74

some of these methods. Therefore, the squad leader must select the method or combination of methods to best accomplish his purpose. The methods of fire control are: oral, arm-and-hand signals, prearranged signals, passing orders from man to man, personal contact, use of the team leaders, and standing operating procedures.

Formal Fire Command. The rifle squad fire command contains six essential elements that are either given or implied by using one or more of the methods of control. An example of the formal fire command is:

ALERT	Squad
DIRECTION	Front
TARGET DESCRIPTION	Machinegun
RANGE	Four Hundred
METHOD OF FIRE	Automatic Rifleman, two magazines
COMMAND	Fire

Abbreviated Fire Command. When any of the essential elements of the fire command are obvious, they may be omitted. An example of an abbreviated fire command is:

ALERT	Squad
DIRECTION	Front
TARGET DESCRIPTION	(Obvious, therefore omitted)
RANGE	(Obvious, therefore omitted)
METHOD OF FIRE	Automatic Rifleman, two magazines
COMMAND	Fire

Landscape Target Firing. Landscape target firing exercises are excellent vehicles for reviewing and developing proficiency in application of fire and fire control. This training is conducted on a 25-meter indoor or outdoor range.

FUNDAMENTALS OF SQUAD DEFENSIVE NIGHT FIRING

GENERAL

The squad will encounter several difficulties while defending during periods of limited visibility which seriously hamper the use of daylight techniques.

Surveillance. The squad sector cannot be seen in depth or width as in the daytime. Targets will normally be detected by the man in whose sector they appear since no one man can see the entire squad sector of fire.

Application of Fire. Because of limited visibility the fires of the squad will seldom, if ever, be applied on linear, column, point, or area targets as during periods of good visibility.

Fire Control. The squad leader cannot control the squad fires as he does during the daytime. Very few of the control measures used during daylight are effective during period of limited visibility. Voice commands are not dependable, arm-and-hand signals cannot be seen, and it is difficult for the squad leader to use personal contact effectively.

Ammunition Conservation. At night there is a tendency for the squad members to fire indiscriminately at noises, suspected enemy locations, and targets that are not appropriate for their weapons.

To overcome difficulties encountered during periods of limited visibility, special techniques must be developed to insure proper—

Surveillance of the squad sector.
Application of fire.
Fire control.
Ammunition conservation.

SURVEILLANCE OF THE SQUAD SECTOR

To insure that all assaulting enemy personnel appearing within the limit of visibility are detected, the squad sector is divided into individual sectors for surveillance purposes.

Team Leaders and Riflemen. Each team leader and rifleman searches that portion of the squad sector, corresponding to their position in the squad, out to the limits of visibility (fig. 41). Much closer coordination is necessary than in daylight. This may require placing a stake at the limits of visibility. The occupants of foxholes are also responsible for insuring continuous contact between adjacent foxholes.

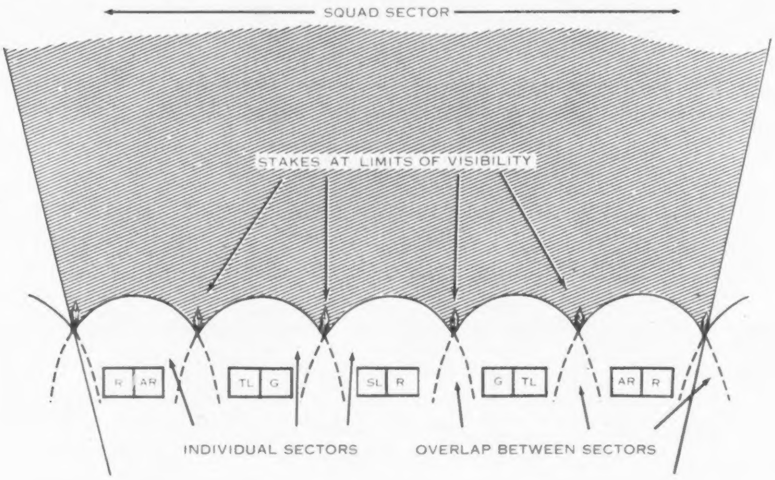


Figure 41. Surveillance by team leaders and riflemen during periods of limited visibility.

Automatic Riflemen and Grenadiers. The automatic riflemen and grenadiers will look for and fire on muzzle flashes of supporting enemy automatic weapons which appear anywhere in the squad sector. However, the type of terrain, degree of visibility, or personnel shortages may make it necessary to assign individual sectors to the automatic riflemen and grenadiers to insure complete coverage of the squad sector.

APPLICATION OF FIRE

Normally, only two types of targets will appear in the squad sector: assaulting enemy personnel, and supporting enemy automatic weapons. The squad members must be able to engage visible targets.

Visible Targets. In order to insure effective engagement of visible targets and prevent indiscriminate firing, the following techniques are applied:

Team leaders and riflemen. Team leaders and riflemen will engage visible assaulting personnel using the pointing technique. They do not fire at the flashes of enemy automatic weapons unless ordered to do so by the squad leader.

Automatic riflemen. The automatic riflemen have as primary targets enemy automatic weapons in the squad sector which are firing effectively on the squad or other friendly elements. They use as their aiming point the muzzle flashes of enemy automatic weapons. By firing three-round bursts they can place a heavy volume of accurate fire on the target. In the absence of primary targets, the automatic rifleman will fire at assaulting enemy personnel.

Grenadiers. The primary targets for the grenadiers are supporting enemy automatic weapons. The secondary targets for the grenadiers are assaulting enemy personnel.

Preplanned Fires. The squad will use preplanned fires to engage targets or to cover points and areas with fire *beyond the limit of visibility.*

FIRE CONTROL

During periods of limited visibility, fire control is extremely difficult. The squad leader cannot see except in his immediate vicinity. Normally the enemy is so close when detected there is not time for the squad leader's decision as to where and when to fire. Therefore, special techniques have been developed for controlling squad fire.

Opening Fire. Team leaders and riflemen open fire without command when they see assaulting enemy personnel. They do not fire at noises. Automatic riflemen and grenadiers open fire without command on supporting enemy automatic weapons or on observed personnel.

Distributing Fire. The enemy normally assaults in a line formation to achieve maximum firepower to the front. With each rifleman and team leader searching his sector and opening fire properly, effective fire distribution is automatically achieved.

Shifting and Concentrating Fire. If the enemy assault hits only certain portions of the squad front, the squad members must shift and concentrate their fires to these areas, firing no more than two or three rounds, and then shift back to their own sector.

Ceasing Fire. The squad members cease fire without command when they no longer see appropriate targets. When delivering preplanned fires, they cease fire on command.

Ammunition Conservation. Wasteful, indiscriminate firing is avoided by the proper application of fire and the effective use of the fire control procedures outlined above.

Control by the Squad Leader. The special techniques discussed herein for applying and controlling squad fires during periods of limited visibility will greatly assist the squad leader in his job of fire control. However, he must continuously supervise to insure the techniques are being applied properly. During a fire fight, he must move to a position where he can best influence the action. When necessary, he supplements the techniques of applying and controlling fire with appropriate orders.

FUNDAMENTALS OF SQUAD ASSAULT NIGHT FIRING

GENERAL

The squad will encounter several difficulties while assaulting during periods of limited visibility. For example:

Normally, sights cannot be used.
It is difficult to move fast while maintaining alinement.
It is difficult to reload the weapon.
Squad members have a tendency to fire high.
It is difficult to apply fires properly while moving.

FUNDAMENTALS

To overcome these difficulties, the squad members must apply special techniques.

Firing Positions.

Team leaders, riflemen, and automatic riflemen use the pointing technique during the night assault. Automatic riflemen fire a short burst (two or three rounds) when the left foot strikes the ground.

The grenadiers fire as rapidly as possible using the pointing technique.

Movement and Alinement. The squad must reach the objective in the shortest possible time. To accomplish this, the following techniques are used:

The squad moves as rapidly as possible consistent with its ability to fire accurately and maintain alinement.

A base man is designated in each squad. All other squad members guide on the base man. By controlling the speed of the base man, the squad leader can adjust the speed and direction of the squad.

Visual contact is maintained between all squad members. The interval is determined by the degree of visibility. Under no circumstances should the interval exceed 10 meters.

Alinement can be maintained by visual contact and sensing friendly muzzle flashes on the flanks.

Squad members must not stop during the assault. Stopping disrupts alinement and reduces the speed of the assault. When the squad members' weapons have stoppages, they keep moving and reduce the stoppages while moving.

Reloading. Rapid reloading is a must to avoid lulls in the firing. Rapid reloading is achieved by practice and by applying the following techniques:

Prior to the assault, ammunition must be checked to insure it is clean and serviceable. Magazines are inspected to insure they are clean and will work in the magazine recess.

Ammunition is carried in a manner which will permit rapid reloading. Flaps on ammunition pouches are folded back.

When bandoleers are used, all wrappings are removed.

Squad members must retain their empty magazines, by placing them inside their field jackets, or in a container attached to their belts.

Grenadiers remove the plastic cups from the 40-mm projectiles and carry them loose in the ammunition pouches.

Keeping the Fire Down. Squad members have a tendency to fire high. This can be overcome by—

Making an initial bold depression of the muzzles of their weapons.

Using tracer ammunition to adjust their fire. Tracer ammunition will also illuminate the objective area, and has a demoralizing effect on the enemy.

Fire Distribution.

Team leaders and riflemen fire on that portion of the objective corresponding to their position in the squad. If there are no targets in their sector, they may fire as far to the left or right as safety permits.

Automatic riflemen fire on as much of the squad's objective as possible, giving priority to enemy automatic weapons. In the absence of enemy automatic weapons, they will distribute their fire in short two- or three-round bursts over their team's portion of the squad's objective area.

Grenadiers fire on as much of the squad's objective area as possible, giving priority to enemy automatic weapons. In the absence of automatic weapons, they will distribute their fire over their team's portion of the squad's objective area.

Normally the squad leader does not fire. His primary concern is control of the squad.

CHAPTER 7

TACTICS OF THE RIFLE SQUAD

RIFLE SQUAD IN ATTACK

MISSION

The mission of the rifle squad is to close with and kill or capture the enemy.

The rifle squad consists of two unbalanced fire teams:

ALFA team contains a team leader armed with an M16A1 rifle; an automatic rifleman armed with an M16A1; a grenadier armed with the M203 grenade launcher mounted on the rifle, and a rifleman armed with the M16A1 rifle.

BRAVO Team is the same as ALFA except that it has one additional rifleman.

There are three principal tasks which must be performed with respect to the enemy to insure the accomplishment of the mission. These tasks are:

Find and fix. The enemy must be located and then held in position to facilitate maneuver against him. At squad and platoon level, "finding" the enemy means determining the exact location of the enemy, where men and crew-served weapons are emplaced on the ground. The "fixing" at small unit level normally is accomplished by firing on known or suspected enemy positions and thereby fixing him in position. This action prevents the enemy from observing and reacting to the friendly maneuver.

Fight. Attack elements maneuver against and close with the enemy, seek to get on his flank, and attack his weakness.

Finish. Attacking elements either destroy or capture the enemy in the final assault.

One unit can be involved in the accomplishment of any one or more of these three tasks. In some situations, the first task *to find and fix* may have been accomplished by another unit, leaving only the second and third tasks, *to fight* and *to finish*, to be accomplished. However, all three tasks can be accomplished by one unit in a single action.

DUTIES OF LEADERS

Squad Leader. The squad leader displays positive leadership to his squad and is responsible for its discipline, welfare, and combat proficiency. He continuously estimates the situation, keeping in mind all possible courses of action, and carries out his assigned mission by vigorously executing the most practical and effective course of action until his mission is accomplished. He positions himself where he can best influence the action.

Fire Team Leader. The fire team leader displays positive leadership to his fire team and maintains discipline, welfare, and combat proficiency. He carries out his assigned mission by vigorously executing the most practical and effective course of action until his mission is accomplished. He assists in controlling the squad by setting the example and by initiating action as a fighter-leader.

EMPLOYMENT AND CONTROL

The squad most often attacks as a part of the platoon, moving as a unit under supporting fire from other weapons. However, there are times when the squad itself must execute fire and maneuver and/or movement. This is best accomplished by using one fire team as the fire support element and the other fire team as the maneuver and/or movement element. In squad combat formations, the tactical integrity of the fire team is maintained. The squad leader adopts a suitable combat formation and alters it to conform to changing conditions during the attack.

The squad leader controls his squad by issuance of orders and supervision of the execution of those orders. He maintains the formations and controls the rate and direction of movement by use of voice, visual, and sound signals. He controls the fire of the squad and utilizes it to maximum effect in the accomplishment of his mission. He positions himself where he can best influence the action. The fire team leaders assist the squad leader in controlling the squad by supervising the actions of the members of their fire teams and by initiating action as fighter-leaders.

PREPARATION FOR THE ATTACK

TROOP LEADING PROCEDURE

While the squad is in the assembly area or the attack position, the squad leader goes forward to receive the platoon leader's attack order. The squad leader begins his troop leading procedure immediately after receiving the attack order.

If time permits after the squad leader receives the platoon leader's attack order, he makes a detailed reconnaissance. When time does not permit, the squad leader may only be able to observe the terrain from the location where he received the order. He studies the terrain, paying particular attention to his route, landmarks on which to guide, and known or suspected enemy positions. The squad leader also plans the formation and actions required to accomplish the mission. When time permits, he issues his order to the entire squad in the assembly area. Since his men have not seen the terrain, he uses a sketch or other means to orient them. He questions his squad members to determine whether they understand the order. During the attack the squad leader supervises the actions of his squad. There are times when the order is issued very hurriedly while the squad is moving forward or in the attack position.

PLAN OF ATTACK AND ORDERS

The squad leader's plan of attack covers the planned actions of the squad from the assembly area through the consolidation on the objective. The squad leader selects a combat formation that provides control, speed, flexibility, and security. He takes a position in the formation from which he can exercise maximum control and coordination with other leaders. He plans in detail any anticipated action at danger areas along the route, such as seizing key terrain short of the objective.

The squad leader follows the operations order format with special emphasis on paragraph 3 of the order (chap. 5). The squad attack order includes, but is not limited to the following:

Pertinent enemy information; information of friendly troops including the objective of the next higher unit; the mission and locations of adjacent units; and the fire support expected from higher units.

The squad mission or objective.

A summary of the squad's overall plan of action to include formation, route, tentative location of the *final coordination line*,* and how it fits into the platoon plan; the duties of squad members; the use of the automatic rifles; security measures to be taken; actions to overcome resistance encountered short of the objective; instructions regarding deployment for the assault; consolidation of the objective; and coordinating instructions, including the line of departure and time of attack.

---

*A line close to the enemy position used to coordinate the lifting and shifting of supporting fires with the final deployment of maneuver elements. It should be recognizable on the ground.

CONDUCT OF THE ATTACK

GENERAL

Often, as part of the platoon, the squad moves into the attack very rapidly, spending little or no time in the attack position. Whether the squad occupies an assembly area or the attack position, the squad leader follows the same general sequence of action previously described, so far as available time permits.

ASSEMBLY AREA, ATTACK POSITION, LINE OF DEPARTURE

Weapons, ammunition, rations, and special equipment, (e.g., flamethrowers and demolition kits) are issued and checked prior to the attack. The squad moves from the assembly area to the attack position under platoon control. This move is by foot, motor, or air.

In the attack position the squad takes up the formation it will use to cross the line of departure and makes the necessary last minute coordination. On signal from the *platoon leader*, the squad moves as part of the platoon from the attack position to cross the line of departure. The platoon leader in his attack order designates the platoon formation for crossing the line of departure. Attack positions should be designated even if they are not used. A halt in the attack position is made only when final preparations cannot be completed in the assembly area or on the move. Any unnecessary delay at the attack position needlessly exposes the unit to enemy fires and reduces the degree of surprise which could otherwise be achieved.

LINE OF DEPARTURE TO THE ASSAULT

During the attack, fire team leaders assist the squad leader in controlling the squad. As the squad moves from the line of departure to the final coordination line, the fire team leaders assist in maintaining the formation, the rate of movement, and the direction of movement by supervising the actions of the members of their fire teams. When the squad leader employs fire and maneuver, the fire team leaders control their teams either as a fire support element or a maneuvering element. This leaves the squad leader free to accompany either team or position himself as the situation dictates. If the squad is subjected to artillery or mortar fire along the route, the squad moves quickly through or around the impact area. When enemy resistance, such as effective small arms fire, is encountered, the squad leader immediately initiates aggressive action as follows:

He insures that all men are utilized to return fire by facing the squad toward the threat and makes necessary adjustments in positions of individuals. It is extremely important that the squad react immediately, otherwise the attack may be halted and unnecessary casualties may result. However, if contact with the platoon leader is impossible, or if the squad is so close to the enemy that delay would cause excessive casualties, the squad leader makes a rapid estimate of the situation and either assaults immediately or employs a squad battle drill maneuver as discussed in chapter 4.

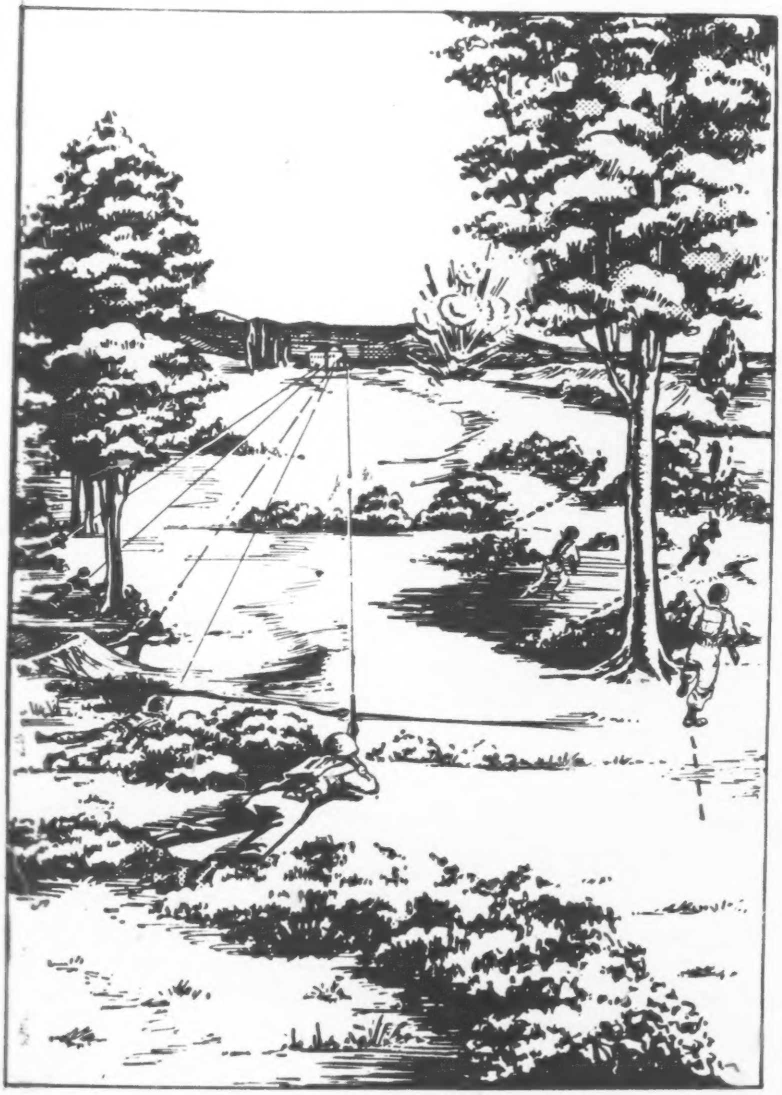


Figure 42. The squad attacks by use of fire and maneuver.

He informs the platoon leader of the situation and his plan for overcoming it. If it is impossible to contact the platoon leader, the squad leader carries out his plan and at the first opportunity informs the platoon leader.

Based on the platoon leader's decision, or when necessary, upon the squad leader's initiative, the squad attacks. It may use fire and maneuver to close with and destroy the enemy: One fire team maneuvers while the other team supports by fire (fig. 42); or the squad advances as a unit by individual or team rushes (fire and movement), or in squad line formation.

THE ASSAULT

The assault is characterized by the volume and accuracy of fire and violence of action. It is designed to kill and demoralize the enemy and to keep him down until the squad can close with and kill or capture him. The automatic riflemen fire from the hip in short bursts covering the squad front. Grenadiers are used to overcome stubborn pockets of resistance. The squad leader normally does not fire; he takes position to the rear of the line where he can move quickly to enforce the continuity of fire, maintain alinement, and keep the assault moving aggressively. All squads guide on the base squad. The squads guiding on the base squad designate as base fire team, the fire team closest to the base squad. As the rifle squad approaches the final coordination line the squad leader, on signal from the platoon leader, deploys the squad on line in the platoon line and insures that each man is firing at the objective. The fire builds up as each man and squad comes on line. If the platoon has achieved fire superiority, the riflemen advance in a platoon line formation, at a rapid walk, firing an aimed shot every two or three steps at known or suspected enemy positions. Initially, the riflemen fire from the shoulder position, pausing long enough to fire an aimed shot. As the riflemen close with the enemy (less than 35 meters), they advance rapidly and aggressively, firing from the underarm position without pausing. When an enemy exposes himself or when a definite target appears, the riflemen pause and fire a well-aimed shot. Throughtout the assault, riflemen fire at every location in their own zone of advance that might conceivably contain an enemy (fig. 43). If the squad cannot achieve fire superiority, they utilize fire and movement until fire superiority is regained or until the objective is secure.

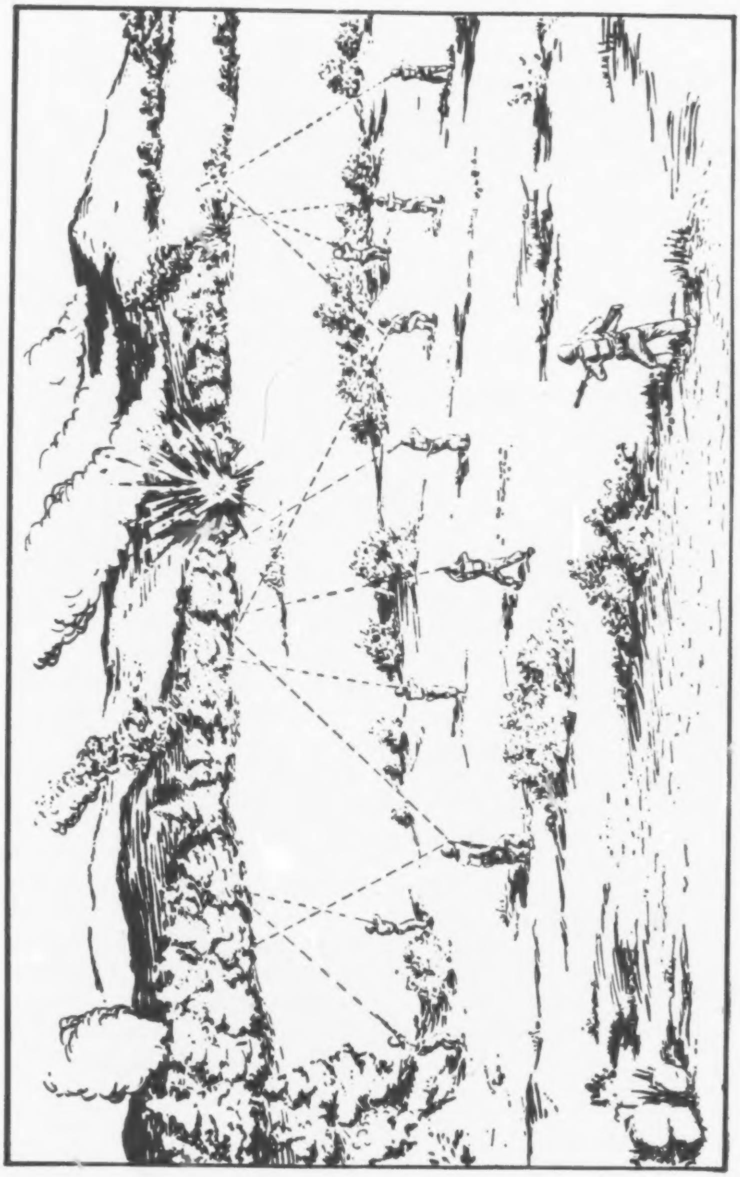


Figure 13. Assault fire used when closing with the enemy.

CONSOLIDATION AND REORGANIZATION

Upon capture of the objective, the squad immediately moves to its assigned area on the platoon objective and prepares to repel any enemy counterattacks. The squad leader, assisted by the fire team leaders, assigns each individual a firing position and a sector of fire. Individuals dig in and the squad leader posts security. During this time, the squad leader makes an estimate of the situation and prepares his squad for continuation of the attack. Consolidation and reorganization are carried on simultaneously.

The squad leader insures that casualties are evacuated and checks the condition of weapons, equipment, and the status of ammunition. Where necessary, he reassigns men to key positions. He redistributes ammunition and reports squad strength and requirements for weapons and ammunition to the platoon leader. Reorganization is a continuous process which receives special emphasis on the objective.

RIFLE SQUAD IN DEFENSE

CONCEPT OF DEFENSE

The concept of defense includes: the organization of a battle area where the enemy is to be engaged in decisive combat; the use of security forces to provide early warning of the enemy's approach, to delay and disorganize him, and to deceive him as to the location of the battle area; the employment of reserves to limit penetrations, to canalize him, and to destroy and eject the enemy by fire and counterattack.

The *battle area* is that area in which the main defensive strength is concentrated. It is organized to stop, destroy, and drive back the enemy or canalize his movement into areas which favor the defender. Within the battle area, the units of the rifle company are disposed laterally and in depth.

Security echelons, consisting of air and ground forces, are placed as far forward of the battle area as possible, depending upon the time available, availability of friendly forces, and the proximity of the enemy. The security forces delay and disorganize the enemy's advance. They also deceive the enemy as to the location of the battle area, and provide timely information of enemy activity. Security forces avoid close combat whenever possible.

Reserve forces that may be available within the battle area include the reserve platoons of forward rifle companies, the reserve companies of forward battalions, and the reserves of higher echelons.

Any of these reserves can be mobile. They provide depth for the battle area by occupying and organizing defense areas or portions of areas behind the forward units. They are assigned missions to protect the flanks and rear of the battle area, canalize the enemy, stop penetrations, and eject or destroy the enemy by counterattack. Reserves provide flexibility to the overall defense plan.

MISSION AND EMPLOYMENT

The mission of the rifle squad as a part of the forward rifle platoon is, with the support of other fires, to stop the enemy by fire in front of the battle area and to repel his assault by fire and close combat. Squad elements also protect supporting weapons within the platoon's defensive position and provide mutual support with adjacent units. When necessary, the platoon leader may order the squad (or elements of it) to move to supplementary positions to protect the flank or rear of the platoon defensive position. The squad may also be assigned missions independent of the platoon, such as patrolling or establishing and guarding roadblocks.

The rifle squad is used as part of the rifle platoon in the organization and defense of the platoon defensive position. The width of the area to be physically occupied by the squad is affected by the mission, enemy situation, troops available and the terrain. This area should not exceed 100 meters in width unless nonorganic weapons have been employed in the squad area. In close terrain, this figure is much less than 100 meters; in open terrain it approaches 100 meters. The interval between foxholes varies from 5 to 20 meters according to the terrain and the use of single or double foxholes. In close terrain, single foxholes may be 5 meters apart and double foxholes 10 meters apart, while in open terrain the interval may increase to 10 meters for single foxholes and 20 meters for double foxholes. The choice between single and double foxholes is influenced by such factors as morale, fields of fire, and unit strength. Because the double foxholes provides continuous observation and improves individual morale, it is used whenever conditions permit. The squad leader applies the same principles in organizing the squad supplementary position assigned to him by the platoon leader.

PREPARATION FOR THE DEFENSE

Upon receiving the platoon defense order, the squad leader follows troop leading procedure and develops a squad order. The order is issued on the terrain to be defended. The order is clear and definite so that the men in the squad understand the mission and the plan. If time is limited, the squad leader may issue the order as the men are being located or after they have started the preparation of the position.

The squad leader's defense order follows the operation order format which includes:

a. Information of enemy and friendly forces, including the location and identification of adjacent squads and platoons; information as to supporting weapons located within the squad area.

b. Mission of the squad.

c. Positions and sectors of fire for each rifleman, grenadier, and automatic weapon (fig. 44). Provisions for antitank defense by assigning squad antitank weapons to selected members of the squad. Organization of the ground, including the type of emplacements, other instructions, and priority of work.

d. Administrative and supply details such as ammunition resupply and the location of the aid station.

e. Prearranged signals such as pyrotechnics or audible signals designating when to open fire or deliver final protective fires; and the location of the squad leader and platoon leader.

After issuing the squad defense order, the squad leader moves his men directly to their firing positions. Local security posts are manned. At least one sentinel is posted in the squad area. Before work is started, the squad leader verifies the observation and sector of fire of each man. During his check of the positions, the squad leader insures that sectors of fire overlap and the desired density of fire can be delivered on avenues of approach. The squad leader positions himself where he can best observe his assigned area, control his squad and maintain contact with the platoon leader. The squad leader's responsibilities during the preparation of the position include:

a. Effecting necessary coordination when other weapons are located in the squad area.

b. Supervising the preparation of foxholes.

c. Supervising the preparation of range cards to include assisting in the estimation of ranges to prominent landmarks.

d. Supervising the clearing of fields of fire.

e. Supervising the preparation of supplementary positions.

f. Inspecting the positions to insure that camouflage and overhead cover are sufficient.

g. Insuring that all weapons have their battle sight setting and have been test-fired.

h. Preparing a sketch in duplicate of the squad's sector of fire, showing prominent landmarks, or terrain features and the ranges to them. He gives one sketch to the platoon leader and keeps one copy for himself.

Selection of firing positions is essential for each rifleman.

a. The squad leader, in conjunction with his fire team leaders, selects firing positions for each rifleman within the squad and assigns

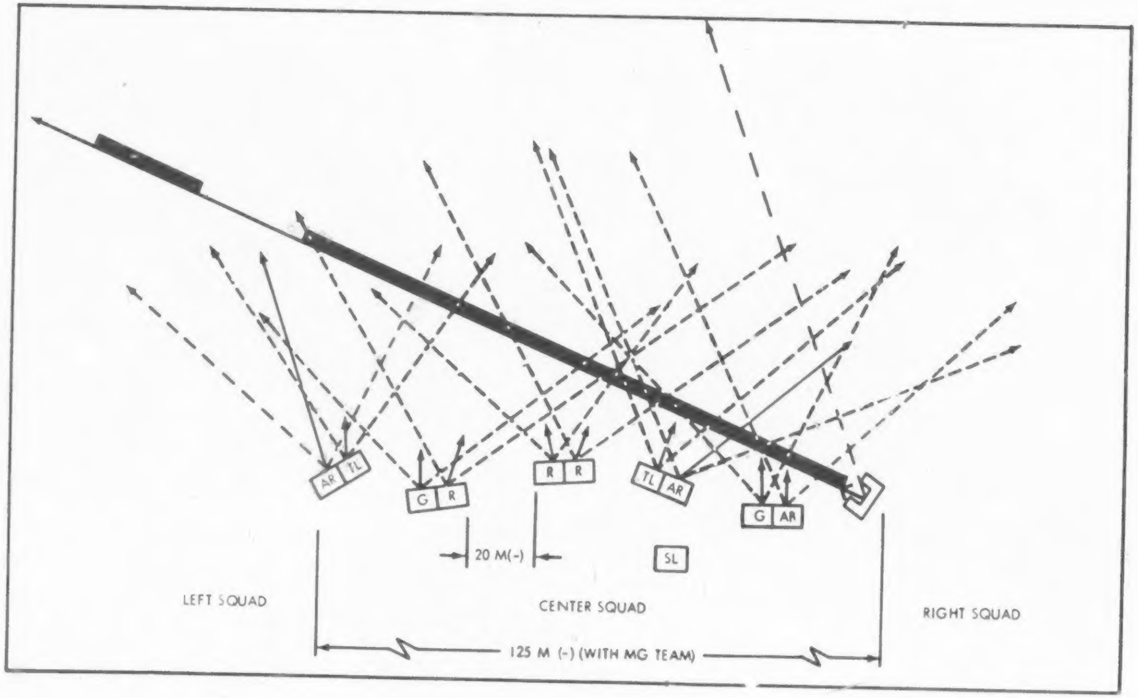

AR
TL
G
R
R
R
TL
AR
G
AR
SL
20 M(-)
LEFT SQUAD
CENTER SQUAD
RIGHT SQUAD
125 M (-) (WITH MG TEAM)

Figure 44. Forward rifle squad in defense.

him a sector of fire. These sectors of fire overlap to insure complete coverage of the squad sector.

b. The squad leader selects firing positions and sectors of fire for the squad's automatic weapons. If possible, the sector of fire assigned each automatic weapon covers the entire squad sector. If not, the automatic weapons are assigned overlapping sectors to cover the squad sector of fire. They may fire into other sectors to assist if no targets appear in their sector.

c. The squad leader assigns the exact firing position and sectors of fire for the grenadiers, if not previously selected by the platoon leader. The sector should be the squad sector or large enough to overlap with adjacent grenadiers. It is used as a direct fire weapon against enemy foot troops at ranges up to 350 meters. Appropriate targets are crew-served weapons and grouped personnel. Grenadiers will cover the areas of dead space in the final protective fires of other weapons and engage other appropriate targets.

d. Team leaders are normally located in an automatic weapon or grenade launcher position, whichever covers the most likely enemy avenue of approach and are assigned a sector of fire. They also assist in the control of the squad. In the absence of the squad leader, the senior fire team leader controls the squad.

e. Each firing position, to include supplementary positions, must be camouflaged, and unnecessary noise and movement held to a minimum. The squad leader requires his men to—

(1) Stay within shadowed areas whenever possible.

(2) Utilize branches and leaves to break up the outline of soldiers, weapons, and equipment.

(3) Conceal mess gear, range cards, rations and ammunition containers, and all other light-colored or glittering objects.

(4) Break up solid areas of color and blend them with the nautral surroundings.

(5) Hide or dispose of fresh earth uncovered while digging foxholes, and weapons' emplacements. Change the regular outline of emplacements by camouflaging them with natural material.

(6) Use only selected paths for movement within and out of the position. If it becomes necessary to move cross country, remove or conceal all evidence of the movement.

(7) In the mechanized platoon, the extra machinegun of each rifle squad may be employed by the platoon leader in the same manner as the machineguns of the weapons squad. Two riflemen from the squad man the gun.

The rifle squad provides for its security by alertness and by implementing its part of the platoon security plan.

Personal contact is the squad leader's means of control. However, his control is often limited by the distance his oral commands can be heard and his visual signals seen. The squad leader anticipates the difficulties of control during the conduct of defense and plans expedients to assist him to overcome these difficulties. Passing information and orders from foxhole to foxhole is one method. Field expedients should be developed to meet specific situations, such as stringing wire or string along the line of foxholes and establishing a set of pull signals to transmit specific messages. Arm-and-hand signals, pyrotechnics, or small arms fire may also be used. Communication trenches should be dug between foxholes as time permits.

CONDUCT OF THE DEFENSE

In the conduct of the defense, the squad leader's duties include:

a. Close supervision of the squad's security plan.

b. Fire control, including the opening of initial fires and the shifting of fires to targets of opportunity.

c. Calling for and adjusting other fire support on targets of opportunity.

d. Shifting men to supplementary squad areas on order of the platoon leader.

e. Keeping the platoon leader informed of the situation and the status of the squad defensive area.

f. Direct, positive leadership at critical points.

g. Effecting further consolidation of the area and reorganization of the squad during lulls in action.

h. Reporting the status of his squad.

i. Keeping his fire team leaders and squad members informed of the situation.

The squad leader observes, controls all personnel, calls for supporting fires, calls in his security, and most important, he controls the fire of his squad. He takes part in the firefight only in the close-in defense of the area. The fire team leaders are fighter-leaders and may fight as riflemen as well as assist the squad leader in controlling the squad.

Squad members open fire upon the approaching enemy on command of the squad leader, or on a prearranged signal as specified in the platoon leader's order. As the enemy nears the defensive area, the rate of fire is increased to inflict maximum casualties and to stop the enemy attack before it reaches the squad area. If the enemy assault reaches the forward edge of the battle area, it is repelled by fire, grenades, and close combat. *The success of the defense depends on each squad holding its assigned area.*

When the attacking force includes tanks as well as infantry, the primary targets for all the squad weapons are enemy foot troops and exposed enemy on the tanks. Antitank weapons fire at tanks which threaten the squad area. If the enemy infantry does not furnish a target, rifle fire is directed against the open turrets and vision slits of the attacking tanks. Men continue firing until forced to take cover to protect themselves and their weapons from the fire and the crushing action of the tanks. They resume their firing positions as the tanks pass and fire on approaching infantry. Maximum effort is made to separate the infantry from the tanks.

During lulls in combat, key men who have become casualties are replaced, ammunition is resupplied, casualties are evacuated, security is reestablished, and the platoon leader is informed of the situation.

During periods of reduced visibility, all members of the squad search and listen for targets for both direct and indirect fire weapons. Hand grenades are used as the enemy comes within hand grenade range. As a general rule, the individual soldiers of the squad hold their fire until targets are visible. Automatic rifles normally are designated to engage enemy threats, such as automatic weapons and flashing targets. In some instances leaders may direct selected weapons to fire at sounds. The use of trip flares, illuminants, and field expedients such as fougasse, provide security and greatly increase observation.

WEAPONS SQUAD IN DEFENSE

The mission of the weapons squad is to provide close fire support and close-in antitank protection for the platoon. The platoon leader employs the machineguns of the weapons squad on the forward edge of the battle area in coordination with the machineguns of adjacent units and the company fire plan, thus his platoon is provided with maximum protection. He employs the antitank weapon in the forward portion of the platoon defensive position.

The machineguns of the forward rifle platoon are located on the forward edge of the battle area to give maximum protection to the platoon position and to cover intervals between platoons. They exchange fires when possible with adjacent units to insure mutual support and participate in final protective fires.

The antitank team is assigned a principal direction of fire to cover the most likely armor approach into the platoon area. The location and principal direction of fire are coordinated with other antitank weapons located within the platoon area. The antitank weapon may also be employed against enemy crew-served weapons and grouped personnel.

PART TWO

TECHNIQUES OF MILITARY INSTRUCTION

CHAPTER 8

THE INSTRUCTOR

THE INSTRUCTOR'S ROLE IN TRAINING

The success of the military depends on the effectiveness of the instruction that individuals and units receive during training. The success of any plan for training will depend upon the soldier-instructors who present subjects to soldier-students. First-class instruction helps to produce a first-class Army, and first-class instruction is the result of having well-trained instructors—instructors who know their subject thoroughly and know how to present that subject to others. The instructor is the keystone in the training (fig. 45).

QUALIFICATIONS OF THE GOOD INSTRUCTOR

There are certain qualifications that an instructor must possess if he is to do an effective job of teaching.

Knowledge of the Subject. It is obvious that the instructor must know his subject if he is to teach it to others. He should know more about his subject than he will have time to teach and, certainly, should possess sufficient background material so as to be prepared to answer virtually any question on the subject.

Knowledge of Techniques of Instruction. A knowledge of how to instruct is a definite prerequisite to good instruction and is the reason for conducting instructor training courses in the Army.

Personality of the Instructor. A good personality is essential to good instruction. Personality can be defined as the sum total of all of those things about an individual to which other people respond, either favorably or unfavorably. Each instructor should observe other instructors whenever he can, and weigh their personality characteristics against his own. He should then strive to develop in himself those characteristics that contribute to successful teaching, and to avoid those characteristics that interfere with effective instruction.

Leadership. Instructors who are good leaders can develop proper habits, attitudes, appreciations, and character traits in their students as well as teach the basic information required in the course. They see that discipline is maintained and that students conduct themselves as soldiers at all times. They maintain control of their classes and see that the classes run smoothly.

Professional Attitude. The instructor who has the proper professional attitude continuously adds to his store of knowledge and skills in his subject and makes every effort to improve his teaching ability. He also has a sympathetic understanding of his students' problems and is fair in dealing with each individual.

INSTRUCTOR IMPROVEMENT

Any instructor can improve himself by bringing about desirable changes in specific aspects of his qualifications, but he can do this only by constant effort. The fact that an instructor has taught for some time does not mean that he has made significant improvement, nor does the fact that an instructor is adjudged superior this year mean that he will be superior next year.

Know What Makes Good Instruction. In his efforts to improve, the instructor must start with an appreciation of the basic elements of good instruction. He must set certain standards for himself.

Observe Other Instructors. The instructor must maintain his individuality while improving his technique. He should observe other instructors for the purpose of learning from them, but probably should not imitate even the most capable ones to too great an extent. Two highly competent instructors can have radically different personalities and use entirely different techniques, and both still be able to do a superior job of teaching. Instructors should determine what they can do well and then develop techniques based on their own outstanding abilities rather than on abilities that they admire but lack.

Analyze Your Own Characteristics. Self-evaluation and self-analysis are essential to improvement. The instructor should constantly attempt to evaluate his own teaching and analyze his own characteristics to find out just what his strengths and weaknesses are. Discover strengths and build upon them; discover weaknesses and correct them.

Concentrate on Specific Elements. Progress is made by concentrating upon specific techiques and working out a systematic plan for their improvement. A general attitude on the part of an instructor to "do good," while commendable, rarely brings the significant improvement desired; attention must be given to improving specific aspects of instruction.

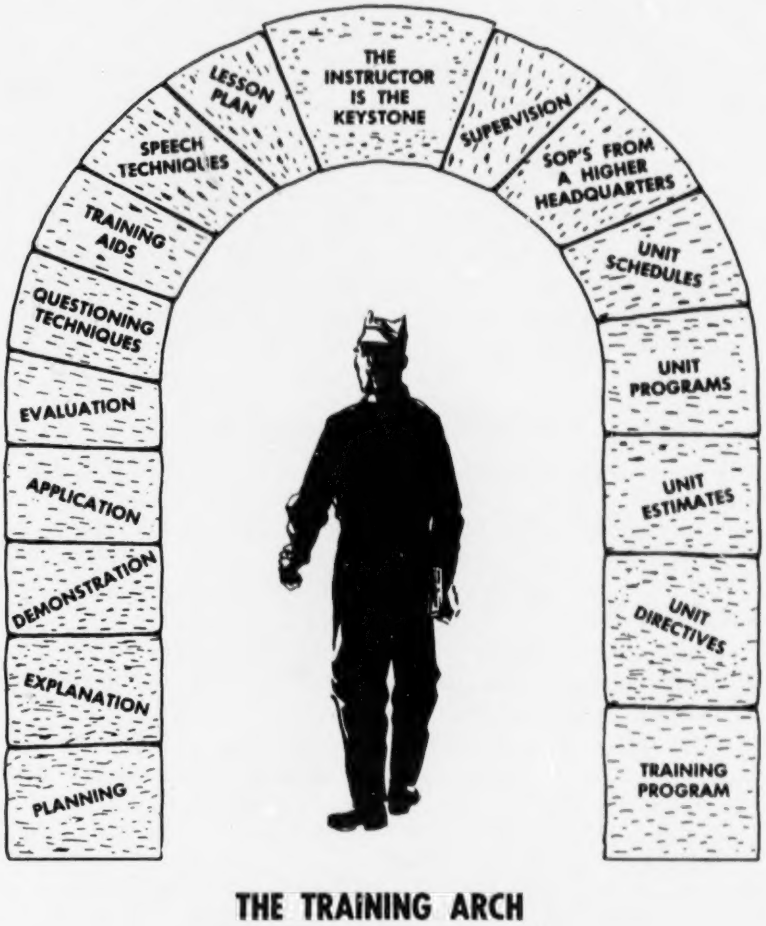

THE INSTRUCTOR IS THE KEYSTONE
LESSON PLAN
SPEECH TECHNIQUES
TRAINING AIDS
QUESTIONING TECHNIQUES
EVALUATION
APPLICATION
DEMONSTRATION
EXPLANATION
PLANNING
SUPERVISION
SOP'S FROM A HIGHER HEADQUARTERS
UNIT SCHEDULES
UNIT PROGRAMS
UNIT ESTIMATES
UNIT DIRECTIVES
TRAINING PROGRAM
THE TRAINING ARCH

Figure 45. The training arch.

Seek Help of Associates. An instructor cannot always evaluate his own work objectively. He should invite others to critique his instruction and should welcome their suggestions. Other instructors, assistant instructors, and supervisors can identify an instructor's strengths, and weaknesses more readily than can the instructor himself.

Make a Constant Effort To Improve. The instructor's attitude toward his work is best judged by the effort he makes to improve. After each lesson, the good instructor asks himself how he might have done the job better. He is not satisfied with anything but the best. Constant alertness in seeking the best methods to improve his students' learning is the most important single ingredient in the instructor's recipe for improvement.

GOOD STUDENT-INSTRUCTOR RELATIONSHIP

To be successful, instructors must have the respect of their students. Instructors may gain the respect of their students by displaying correct attitudes toward them. The respected instructor displays friendliness that is sincere and objective. He respects the personality of each student, and avoids judging students in terms of racial, geographical, or intellectual groups. He maintains an attitude of reserve and guards against overfamiliarity with his students. Finally, he displays the attitude of being firm and frank when it is in the best interest of the student and the Army. An excellent way of developing the proper attitude toward students is to think of them as possessing the following characteristics:

With few exceptions, they are mentally, emotionally, and physically capable of learning.

Most of them have a serious purpose and are eager to get the most from their training.

They are keenly interested in the practical applications of theory and knowledge. They judge instruction in terms of their needs and the demands of their jobs. They are interested in the *why* and *how* of what they are asked to do.

They are quick to appreciate and respect instructors who know their subject and who have the knack of effective presentation. They are equally quick to detect the incompetent.

They vary in their physical characteristics, intelligence, general education, past experience, determination or desire to achieve, and emotional stability. Instructors must be aware of these differences and take them into account. However, most students are capable of mastering the essentials of military training if they are well taught.

ADVICE TO INSTRUCTORS

There are certain rules of conduct that instructors must follow if they are to be successful (fig. 46).

Never Bluff To Cover Lack of Knowledge. Instructors must know their subjects thoroughly, but even then, questions may arise to which they do not know the answers. If you do not know the answer, admit it and then find the correct answer and give it to the class as soon as practicable.

Never Use Profanity or Obscenity. The instructor who does risks losing dignity and the respect of his students.

Never Use Sarcasm or Ridicule. Since students are helpless to retort, they become resentful. When an individual is resentful, his mind is closed to learning.

Never Talk Down to a Class. Make the class feel that you consider yourself fortunate to share your experience and knowledge with fellow members of your profession.

ADVICE TO INSTRUCTORS

1. NEVER BLUFF.
2. NEVER USE PROFANITY OR OBSCENITY.
3. NEVER USE SARCASM OR RIDICULE.
4. NEVER TALK DOWN TO A CLASS.
5. NEVER LOSE PATIENCE.

Figure 46. Advice to instructors.

Never Lose Patience. Slowness or failure of the student to grasp a teaching point may mean that the instructor has failed to teach. Carefully analyze the situation to determine the cause for the lack of class understanding.

CHAPTER 9

PRINCIPLES OF INSTRUCTION

THE NATURE OF LEARNING

The desired outcome of all instruction is student learning. If students are no better equipped to do something at the end of a lesson than before it, no learning has resulted from the instruction. Instructors must realize that if the student failed to learn, the instructor failed to teach. Instructors must accept responsibility for their students' learning and look first to themselves and their presentation for the cause of any failure.

Learning, an Active Process. Learning can be defined as the process of acquiring new knowledge, skills, techniques, and appreciations that will enable the individual to do something that he could not do before. Notice that the emphasis is placed upon *doing*. Learning is essentially an active process; it is not passive absorption. Students must be given purposeful, worthwhile work to do; they must be kept active both mentally and physically.

Learning Through the Senses. Learning can also be defined as the change that takes place in the individual as a result of his mental and physical responses to stimuli. The five senses are the channels through which the individual is stimulated; through these senses—sight, hearing, touch, taste, and smell—he makes contact with things about him. As a result of these contacts, he makes responses that lead to the acquiring of new knowledge, habits, or attitudes. It is the instructor's responsibility to provide learning situations that make maximum use of the senses and produce the desired responses. In general, lessons that appeal to the greatest number of senses are the most effective. This is one reason why maximum use should be made of training aids and demonstrations.

THE INSTRUCTIONAL PROCESS

The instructional process (fig. 47) is the basic procedure for teaching a single lesson objective or an entire phase of a subject. It is a three-stage process: presentation by the instructor, application by the student, and evaluation by the instructor. Within this framework, the instructor applies specific instructional methods and techniques for achieving the most effective teaching-learning situation.

Presentation. In this stage of the instructional process the student gains the initial concept of what he will learn. He may gain the concept by completing a study assignment, by listening to the instructor's explanation, or by watching a demonstration by the instructor. For most military subjects, effective presentation will consist of a combination of these activities: study by the student, and telling and/or showing by the instructor.

Application. In this stage of the instructional process the student is given an opportunity to apply or practice the new concepts gained in the presentation stage. Although all three steps of the instructional process are necessary for effective learning, *application* is the most critical. All learning requires conscious and successful response by the student. In planning and conducting instruction, the instructor should remember that *it is not so much what the instructor does or says that teaches, but rather what he causes his students to do.*

Evaluation. In this phase of the instructional process the instructor checks student responses, keeps students informed of their success or progress, and prevents them from practicing incorrect responses. Evaluation includes formal testing of students at the end of a class or phase of instruction; however, the most important type of evaluation is informal and is concurrent with the presentation and application stages of the instructional process. Such evaluation is accomplished by oral questions to the class following the explanation or demonstration of a teaching point, and by close observation of students during practical work to detect errors and make on-the-spot corrections.

PRINCIPLES OF INSTRUCTION

The seven principles of instruction are generalizations that describe conditions and requirements for effective teaching and, thus, effective learning. They should guide the instructor in using the *instructional process* and in selecting and using specific methods and techniques of instruction. They are—

Motivation. The student must want to learn before he can be taught. A major requirement for effective instruction is to develop and sustain the desire to learn in the student. Here are some of the techniques that may be used to motivate students—

a. Show a Need. It cannot be assumed that students will recognize the importance of learning the lessons presented in a training program. Instruction must include valid reasons for learning and an explanation of how the things taught will be used.

b. Develop an Intent To Learn. Before instruction is presented, the student must be made to realize that he is responsible for learning.

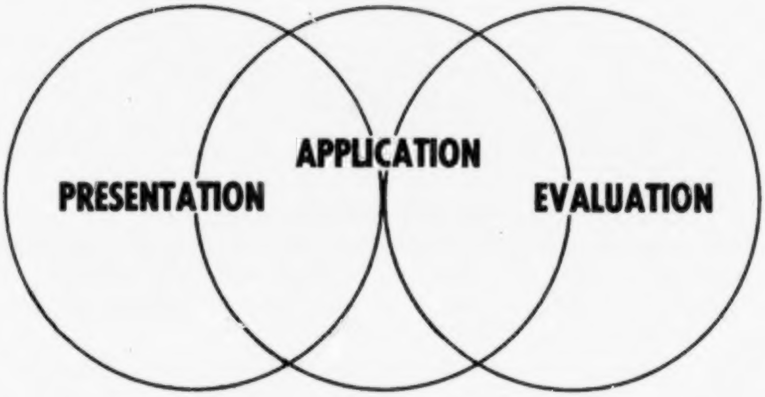


Figure 47. The instructional process.

It is not enough that students are physically present for training; they must be mentally prepared to learn. The instructor must check class progress frequently and insist that each man apply himself. Students learn more when they are made to feel responsible for learning.

c. Maintain Interest. Student interest is essential if teaching is to be successful. The use of personal force and enthusiasm, examples, and illustrations will help keep interest high. The more interesting the material can be made to the student, the more readily it will be learned. The instructor, however, must keep in mind that his responsibility is to teach not to entertain.

d. Encourage Early Success. Early success is a motivating force that sets the stage for further learning. An individual's success tends to drive him to further effort and additional successes. To the normal person, achievement brings a certain pleasure and satisfaction and is a stimulus to greater activity. During the early stages of a training program, the instructor should have his students work at some worthwhile activity that can be completed successfully.

e. Give Recognition and Credit. Recognition and credit provide strong incentives for learning. Students desire, and have a right to expect, credit for work well done. Instructors must mention the good points of students' work and not dwell entirely on their mistakes. Start with favorable comments, and then lead into suggestions for improvement.

f. Avoid Feelings and Emotional Responses That Interfere With Efficient Learning. Feelings affect learning. Students who are angry, resentful, embarrassed, frightened, or otherwise upset think about the source of their disturbance rather than the subject being taught.

g. Use Competion. Friendly competition stimulates learning. Such competition between two or more groups or teams normally achieves efficient learning. When appropriate, instructors should divide classes into groups and encourage such groups to compete. When possible, one group should be pitted against another, rather than one individual against another. Even having a student compete against his own past record is a highly desirable form of competition, if the situation permits.

h. Use Rewards and Punishment. Rewards are powerful incentives. On the other hand, fear of punishment is perhaps the least desirable form of motivation. The imposition of punishment that the student considers to be unjust or too severe may breed resentment and antagonism and result in a failure to learn.

Objctive. Learning is most efficient when the student knows exactly what he is to learn and what is expected of him. The instructor should set forth at the beginning of each period of instruction the goals that the student is to achieve—exactly what he should be able to do and how well he should be able to do it as a result of the instruction. Further, the student should be told how each lesson fits into the overall program of instruction and how the course of instruction prepares him for his job.

Response. A student learns only what he responds to. His response may take many forms: listening, observing, reading, recalling, taking notes, reciting, writing, practicing, or solving problems. The instructional process of *presentation—application—evaluation* centers on instructors applying this principle of instruetion. Every period of instruction should be planned to require the student to respond frequently in a form that can be observed and evaluated by the instructor. "Practice makes perfect" only when the student practices correctly.

Reinforcement. Efficient learning requires that the student know whether his responses are right or wrong. Application of this principle is the heart of the *evaluation* stage of instruction. If the student knows that his response is right or successful, the response is strengthened and tends to be fixed in his mind. The student should also be informed of incorrect responses and given an opportunity to correct them. Ideally, the student should know whether he is right or wrong immediately after each response. The longer the delay between response and knowledge of results, the weaker reinforcement becomes. Instruction should be planned so that evaluation is concurrent with the presentation and application stages of instruction. Immediate on-the-spot correction of errors is an essential feature of effective instruction and a necessary requirement for efficient learning. Formal examinations at the end of the hour or phase of training do *not* apply the principle or reinforcement to best advantage.

Realism. This principle requires constant consideration by the instructor to insure that learning activities in training approximate situations in actual practice. Each lesson, or main point of a lesson, should be subjected to the test of these questions—

a. Is this the way this material will be used in actual practice? Instructors must check to see that the material presented is realistic from the standpoint of its field application. However, during the introductory phase of instruction in a subject, the desire for realism should not be allowed to obscure learning. The fact that a soldier in combat may have to read a map during a snowstorm while under enemy fire does not mean that preliminary instruction in map reading should be presented under similar conditions. Realistic obstacles should be introduced into practical work only after basic principles and techniques have been mastered.

b. Is may presentation realistic as far as the level of the class is concerned? Instruction beyond the level of student comprehension is unrealistic; however, relatively difficult subject matter can be presented to classes of different levels if it is adapted to their specific needs and is explained in clear language. Instructors can make instruction more realistic by using such personal references as "Here's what this means to you," or "You will use this in this way."

Background. Learning is based on experience; new experiences are interpreted on the basis of past experience. A person seeing an airplane for the first time may call it a "strange bird" because that describes the new object in the light of things familiar to him.

a. This principle can be applied to instruction in the Army; instructors can explain many new things by using illustrations drawn from the past experience of students and relating these past experiences to the new material. Resistance to the flow of electrical current through various gage wires is likened to the resistance of difference diameters of pipes to the flow of water. An instructor who describes carburetion as "the atomization of combustible material to facilitate combustion of ingredients" may be technically correct, but few students will get the full meaning from this explanation.

b. Since the past experience of all students is not the same, they do not all attach exactly the same meaning to an explanation. Instructors must select and present illustrations carefully so that all students will get the desired meanings. In early stages of Army training, instructors must draw illustrations from common civilian experiences. As training advances, more and more illustrations can be drawn from earlier phases of the training program.

c. Instructors apply this principle in the introduction to a lesson by reviewing previous instruction. This helps students recall what they have learned previously. What has been learned in previous lessons contributes to the student's background and prepares him for lessons to be presented. Instructors must consider the state of training of their students, make reference to lessons already learned, and use these lessons as a foundation for their presentations.

Appreciation

a. Learning is complete only when the student has acquired the attitudes, appreciations, interests, ideals, and habits of conduct that will enable him to apply correctly the things learned. This statement is of such importance in military training that it should be considered a fundamental principle for the guidance of instructors. The military instructor must not concern himself solely with the teaching of skills and information that contribute directly to lesson objectives; he must also be alert to the development of correct appreciations and attitudes that determine how effectively the soldier will apply the knowledge and abilities he has acquired in the training program. This principle emphasizes the fact that the instructor's real, ultimate task is to train soldiers—not merely to teach subject matter.

b. Many training publications recognize the necessity for this principle of instruction; they call for such training results as aggressiveness, will to fight, initiative, resourcefulness, and the "spirit of the offensive." These desirable ends are not taught directly; they are developed indirectly as a result of—

(1) Instruction that recognizes these attributes as the byproducts of good teaching.

(2) Leadership that emphasizes and contributes to the ultimate objectives of military training.

(3) Carefully designed training programs that provide numerous realistic situations in which these qualities have the opportunity to develop.

c. To apply this principle in his teaching, the instructor must be alert to every facet of the student's development. He must recognize that his students learn many things from his instruction in addition to the material presented. He must set a good example; he must instruct with a positive attitude. Students are quick to pattern their reactions to the attitude of the instructor. The instructor must refrain from making incidental remarks or voicing personal opinions that may have an unfavorable effect on student attitudes. The instructor should give advance thought to the favorable attitudes, appreciations, interests, ideals, and habits of conduct that may result from instruction, and make every effort to contribute to their development.

CHAPTER 10

PRESENTING ORAL INSTRUCTION

GENERAL

An essential requirement of all instruction is effective communication between the instructor and the student. This chapter deals with the organization and presentation of oral units of instruction. It is organized into three phases: the introduction, the explanation, and the summary. This is the basic organization for effective oral presentations; in other words, "Tell 'em what you're going to tell 'em; tell 'em; and then tell 'em what you've told 'em."

ELEMENTS OF THE INTRODUCTION

The objective of the lesson and the reasons for learning should always be included in the introduction. Other elements that may or may not be included are a review of previous instruction and the procedure to be followed in conducting the lesson. These elements follow no set order, and the instructor should not develop a stereotyped pattern. For each lesson, he should write out or fix in his mind what he intends to say in the introduction and then be sure that he has included all necessary and desirable elements.

Objectives of the Lesson. State briefly and clearly what is to be learned. State objectives in terms of what students will be able to do, the conditions under which they should be able to perform, and the performance standards they must achieve. Students learn best when they have clearly defined goals to achieve. In fact, students spend a great deal of time and effort trying to find out what the instructor really wants them to learn. Don't hide from the students the fact that they must memorize a procedure, be able to perform an operation, define terms, and identify components. State lesson objectives forcefully and enthusiastically. *Never* preface your remarks with "This is the driest subject in the Army," or "Regulations require that this subject be taught; so bear with me."

Reasons for Learning the Lesson. American soldiers like to know the *why* of things; the instructor should strive to satisfy that curiosity. If the lesson involves something that may be helpful in saving the

106

soldier's life, tell him so. Make the reasons convincing. Make students feel that it is important to them as individuals to learn the lesson. Use real-life examples and illustrations. Relate some personal experience that will drive the point home. If your experience is limited, describe an experience that some other person has had, or use a hypothetical example that will show the value of learning. Whenever possible, stress the particular importance of the lesson.

Brief Explanation of the Procedure To Be Followed. When students know what is to take place, they will be more attentive. To illustrate: "During the next 2 hours we will follow this procedure. I will explain the steps as my assistant goes through the disassembly and assembly of the weapon. Watch him closely, and disassemble and assemble each part immediately after he does. The assistants will check you as you proceed. When that has been completed, you will disassemble and assemble the weapon at your table under the supervision of an assistant. Enough time is allowed to permit you to do this several times. Practical tests will be conducted during the last 30 minutes so that each man can see how well he has learned the lesson."

Review of Previous Instruction. In every unit of instruction that is a continuation of previous instruction, the introduction should contain a tie-in or a brief review of the previous instruction. This is one application of the principle of background and serves to recall information the student has already learned as well as to place every member of the class on a common footing.

THE EXPLANATION

In the explanation or body of the oral presentation, instructors actually present their teaching points. Subject matter is explained, understanding is developed, and appreciations are stimulated. Oral explanations are the road maps to competent performance. They should be the guides by which the student takes the shortest route to learning how to do something effectively.

Organization of the Explanation. The explanation must be so organized that the students can follow the order of presentation. An organization that is completely understandable to the instructor, or to someone else familiar with the subject, may not be logical for presentation to students getting their first knowledge of the material. The instructor must limit the number of main topics discussed. Students can easily remember two or three main topics, and can remember four or five with little difficulty; whereas the presentation of eight or ten main points will confuse them. Some instructors help students follow the organization by using training aids that list the main points.

Transitions Between Points. Getting from point to point is a problem that instructors must solve in presenting oral instruction. A well-presented lesson progresses by steps. When presented smoothly, the parts are connected by transitional words, sentences, or statements. Transitions make it easy for students to follow the instruction and to know when one point is finished and the next is being taken up. Below are some techniques that help instructors to make good transitions. Vary these techniques; do not use the same one or two all the time.

a. Refer Often to the Objectives of Your Lesson. For example, in teaching the principles of war, go to the next principle by referring to your objective: "Another principle of war that we must consider is the principle of mass." This is one very good reason for putting titles on charts; it is possible to go back to the title in making transitions.

b. Use Frequent Summaries. This is a valuable teaching technique because it makes use of repetition. The summary also is an excellent way to get from one point to another. For example, in the lesson on principles of war: "We have considered the principles of simplicity, unity of command, and the offensive; now let us consider the principle of maneuver."

c. Use Rhetorical Questions. For example: "What other general principle can we use as a guide to the exercise of command? We gain advantage over the enemy by applying the principle of surprise."

d. Use Connective Words or Phrases. Words such as however, moreover, therefore, and accordingly all serve as signals that one idea is closing and another opening. Do not fall into the habit of overworking one particular connective, and try to avoid such terms as "now," "all right," or "now we'll take up."

e. Enumerate Points. Use numericals (first, second) or list the points on a chart.

Maintaining Student Interest. The instructor must make every effort to vitalize his material so that the interest of his class will be high. He should never admit that his subject is dry; instead, he should find ways to keep the attention of his students. When the instructor merely talks, student interest soon dies. To keep students interested and to promote learning, make use of the following:

a. Specific Explanation. The specific and the concrete are of interest; the general and the abstract are usually hard to follow and destroy interest. Instructors must be specific and avoid talking around the subject in vague or general terms.

b. Stories and Experiences. Army instructors may use Army professional publications that contain stories and examples that can be used in classes. A quotation from some prominent military leader may stimulate interest and vitalize instruction.

c. Illustrations and Examples. Students absorb readily ideas presented in picture form. To take advantage of this fact, use illustrations and examples. They are easily remembered and make abstract ideas clear. Illustrations and examples may be real, or they may be hypothetical.

d. Rhetorical Questions. Questions bind the instructor and students together. They arouse the sluggish; they compel those who hear to seek an answer. In a lecture, the instructor asks rhetorical questions and then answers them himself. Topic sentences can well be stated as rhetorical questions.

e. Training Aids. The use of charts, diagrams, models, and other training aids will help to keep the subject interesting. Plan to use training aids at points in the oral presentation where the lesson may seem dull. When aids are used to vitalize oral instruction, they hold attention, arouse interest, and help get the teaching points across.

Emphasizing Main Points. If the main teaching points are not emphasized, the student may not grasp them, or he may soon lose them. One of the most effective ways to secure emphasis is by repetition; this is another reason for using frequent summaries in a lesson. One of the least effective ways to emphasize, however, is to repeat an idea immediately after its first presentation. Remember that repetition has its limits; it must be well done and it must be distributed properly or it will become monotonous. In addition, the instructor may emphasize important ideas by questioning, speech techniques, use of visual aids, or any combination of these methods.

THE SUMMARY

The summary should be used at any point in the lesson where there is a need for a brief recapitulation of the points covered. In most cases, no more than three topics should be presented before summarizing, and it is often better to summarize more frequently. Frequent use of summaries throughout the lesson helps students to keep the main points clearly in mind. The lesson should always be concluded with a complete summary—an overall picture of what has been presented in the lesson. This final summary is the instructor's opportunity to wrap up the lesson into a compact package for the students. Keep in mind that the summary must be brief; do not try to reteach the lesson. The summary should contain the following elements in the sequence shown:

Clarification of student questions.

A reemphasis of important ideas, steps of procedure, and safety precautions.

An appropriate closing statement. The closing statement should leave a lasting impression in the minds of the students. It may include a remark or two on some favorable results that were obtained by proper use of a principle, or the disastrous result of malpractice. Above all, it must be related to the objectives of the lesson and leave the students with a feeling of having accomplished the mission.

CHAPTER 11

SPEECH TECHNIQUES

GENERAL

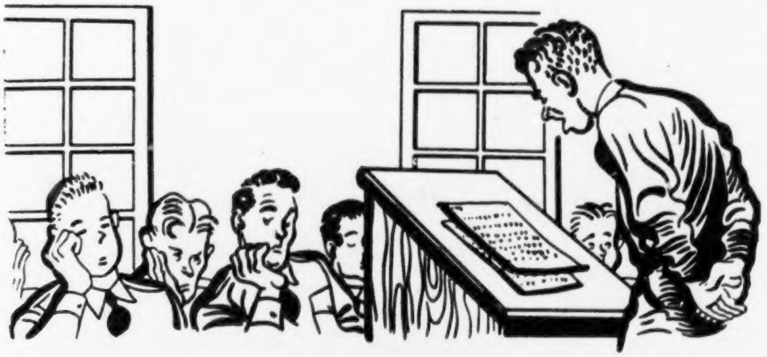
Military leaders who can speak with clarity and logic possess an art that will always serve them well. The ability to speak effectively is essential not only to personal military leadership, but also for efficient instruction. Much of our military training and education takes the form of oral instruction. Unless oral instruction is presented with good speech techniques, interest succumbs to boredom, understanding is replaced by confusion, and potential soldiers are discouraged in their desire to learn. This chapter deals with specific speech techniques. Fundamentals are stressed. An instructor who has no serious speech defect should be able to improve his delivery significantly if he makes a genuine effort to apply these funamentals.

INSTRUCTOR-STUDENT CONTACT

Instructors must not develop the idea that they are making speeches. They must realize that they are not talking *at* students, but are really talking *with* them. The purpose of speech is to communicate ideas. The instructor must establish personal contact with the class and keep that contact (fig. 48). Here are some suggestions that will be helpful—

Get the Attention of the Class. Do not start the class until you have the attention of the students. In some cases, walking to the center of the platform will cause men to quiet down and listen; more often, it will be necessary to ask for their attention. A simple "Your attention, please!" will produce the desired result.

Look at and Talk to Your Students. Observe people in earnest conversation and you will notice that the speaker does not look out the window or at the floor or ceiling. He looks his listeners in the eye. He probably is not conscious that he is doing so; the earnestness of his purpose naturally finds its expression in this personal contact. Address your students and not the training aids or the distant landscape. Give each student the feeling that you are looking at and talking directly to him. Establish eye contact.



ARE YOU MAINTAINING CONTACT?

Figure 48. Maintaining contact.

Speak in a Conversational Tone. Be conversationally direct. Do not let your voice reflect an impersonal, indifferent attitude. Do not orate or declaim. Make frequent use of the pronoun "you"; identify yourself with your students by "you and I" or "We." Leave the impression that you and they have something in common.

Be Alert! Look Alert! Know what is going on in your class. Pay close attention to students' responses. Listen carefully and evaluate their comments and answers to your questions. Be quick to spot an inattentive student. Look directly at him. Take a step toward him, or ask him a question. Continuously ask yourself, "Do my students understand?" Check frequently to make sure they are following you.

CONTROL OF NERVOUSNESS

Almost every instructor experiences nervousness to some degree prior to his initial appearance before a class. This is not undesirable, provided the instructor learns to control it (fig. 49). Nervousness simply indicates that the instructor is aware of the class and is concerned about their reaction to his instruction. Instructors who completely lack nervousness are likely to be stolid, unimaginative individuals who will probably never do more than a mediocre job of instruction. Under control, nervousness usually results in a more enthusiastic and expressive delivery. Good instructors usually devise their own particular techniques of making their nervousness work for them instead of against them. Some of these techniques are—

Be Thoroughly Prepared. The *first* step the instructor can take to overcome excessive nervousness is thorough mastery of the subject and the plan for teaching it. He must next realize that the students are there to learn, that they are more interested in the subject than

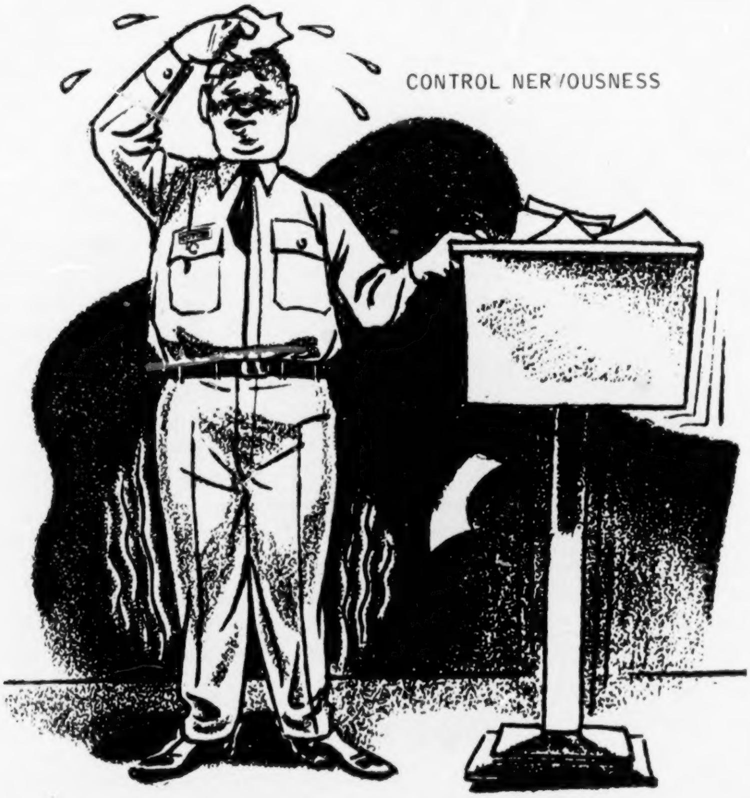


Figure 49. Controlling nervousness.

in the instructor. If he thinks of the subject and the learning that should result from the instruction, his nervousness will take care of itself.

Assume the Proper Mental Attitude. The most reliable weapon the instructor has for overcoming nervousness is a proper frame of mind toward himself, toward the students, and toward the entire instructional setup. In order to assume a proper frame of mind, he must make an intelligent, rational analysis of the situation. He must realize that the cause of the very unpleasant mental and physical reaction he experiences just before a class is *fear*—not of bodily injury, but of what the students will think of him and his instructions. Students expect their instructor to have full knowledge of the subject and to be able to teach it effectively. Although students focus their attention upon instructors, they do not place them on trial immediately. If the instructor has mastered his subject and has made thorough preparation, he has eliminated the real reason for fearing the reaction of the students; he has every right to a feeling of self-confidence, which will go far toward making his presentation a success.

Have Initial Remarks Well in Mind. The first few moments are the most difficult; get past these and thing will go well. It is advisable to have the lesson introduction so well in mind that no notes are needed.

Review Previous Instruction. By starting with a reference to a phase of training previously completed, the instructor immediately causes the students to focus their attention on something with which they are familiar. The instructor thus meets the students on common ground and at the same time gets their attention away from himself.

Tell a Story. Nothing releases tension so quickly as a bit of humor injected early in the introduction. Remember the purpose of telling the story; be sure that it has a point that can be related to the subject. When setting out to get a laugh, make sure that you get one; the purpose is defeated if the story does not go over.

Be Deliberate—Slow Down. When a person is nervous, there is a tendency for all body activities to speed up. Instructors should remember this when they are faced with nervousness. They should be deliberate in movement and speech. After a few moments of deliberate control, the stage fright will pass and the instructor's normal poise and bearing will take over.

MAINTAINING BEARING

Because students react to what they see as well as to what they hear, instructors must make certain that they meet military standards of appearance, bearing, and bodily control. Posture, bodily movements, and gestures can be highly expressive. They can make the difference between an excellent, enthusiastic presentation and a dull, uninteresting lesson. Any physical attitude assumed, any bodily movement, or any gesture that attracts attention to itself is distracting and, therefore, is a hindrance rather than an aid. Movements should appear free, natural, and spontaneous. Strive to appear natural at all times (fig. 50).

Check Posture. Take a position from which the entire class can see you and from which you can see all of the class. Stand erect with weight evenly balanced on both feet. Appear physically and mentally alert, but do not stand rigidly at attention. Relax. The hands? Let the hands and arms hang freely at your sides. The hands do not appear as large and awkward to students as they might seem to you. If you simply cannot let them rest at your side until ready to use them, clasp them in back of you, or let one hand rest on the speaker's stand temporarily. Do not wring and twist nervously. The basic rule

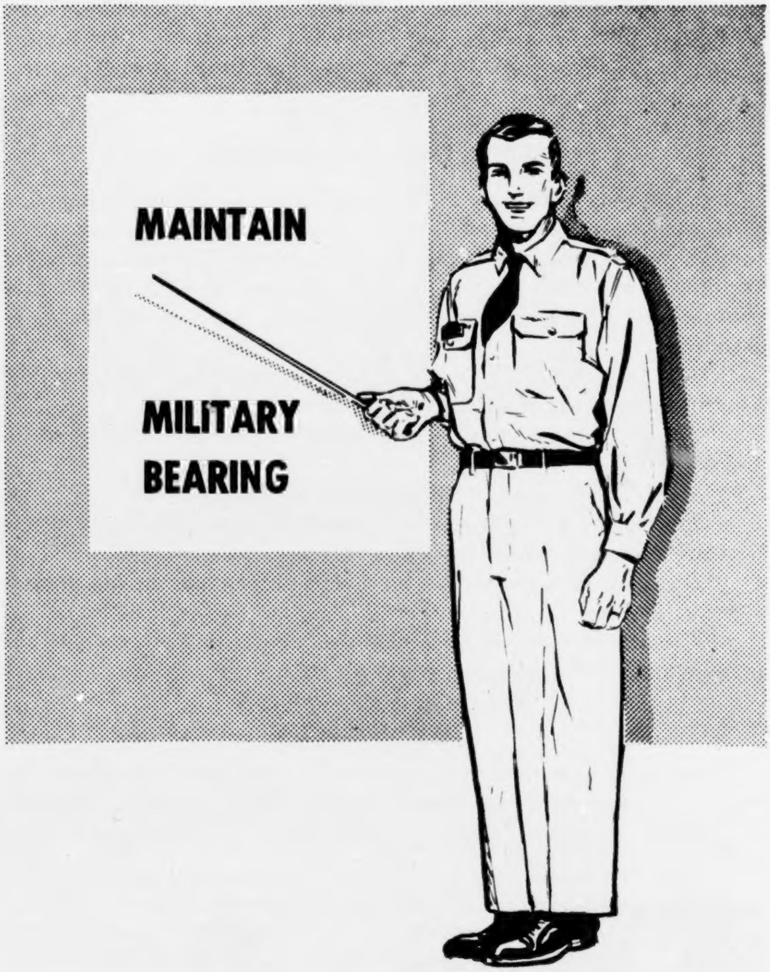


Figure 50. Military bearing.

to remember is moderation. Don't remain glued to one spot and don't keep on the move all of the time. When you do move, move briskly and with purpose. As an instructor's skill and experience increase, he will find his movements becoming less obvious and more meaningful.

Use Gestures. A gesture is the movement of any part of the body to convey a thought or emotion, or to reinforce oral expression. Your arms, hands, and body are your principal means for gesturing. When instructing, let your gestures be natural; never rehearse specific gestures for use at definite points in your presentation. They should arise spontaneously from enthusiasm, conviction, and emotion. Do not try to emphasize every statement with a gesture; to do so would defeat the purpose of gestures.

DISTRACTING MANNERISMS

A rule to remember is that instructors should avoid those things that cause the class to concentrate upon the instructor's mannerisms rather than on the subject matter (fig. 51). Instructors may not be aware of their peculiar mannerisms unless they ask associates for constructive criticism of their delivery. Here are some common habits to be avoided—

"*The Dying Warrior*"—the instructor who leans heavily on the lectern, wears an air of exhaustion, and never moves.

"*The Fig Leaf Stance*"—hands clasped in front below the waist, feet immovable.

"*The Walkie-Talkie*"—the pacer who never stands still.

"*The Chained Elephant*"—who stands with his weight first on one foot and then on the other.

"*The Change Counter*"—who counts the change in his pockets every 2 minutes.

"*The Swordsman*"—who tries to duel or impale students with the pointer, and forgets to put it down when not using it.

ENTHUSIASM

There is no substitute for a physically vital and enthusiastic delivery. Enthusiasm is contagious (fig. 52). It is evident in one form or another whenever a person is doing something he sincerely likes.

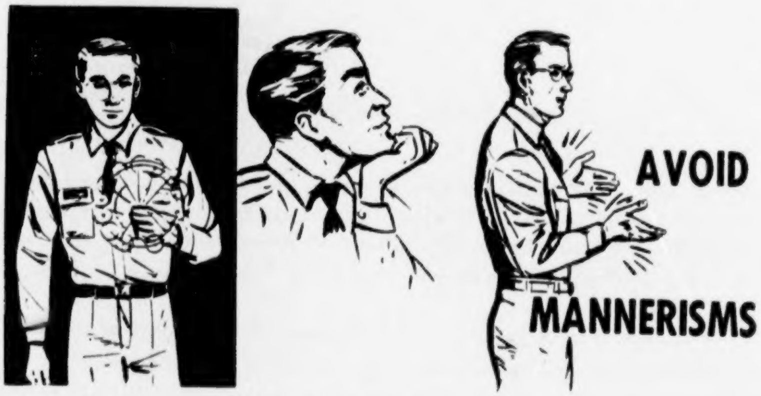


Figure 51. Mannerisms distract.

BE ENTHUSIASTIC

Figure 52. Enthusiasm.

The instructor will find that if he is sold on his subject and conveys his feeling to the class, he will keep his students interested and eager to learn. An enthusiastic instructor will help to develop in the student a favorable attitude and appreciation for the training. The basis for an instructor's enthusiasm is a thorough knowledge of the material being taught and of its usefulness to the students.

BEING HEARD

The instructor's voice is his best teaching tool because it is his most direct means of communication with the class (fig. 53). Most individuals have speaking voices adequate for instruction if they learn to manage a few factors that are basic to good speech.

Voice Quality. Voice quality is that characteristic that distinguishes one voice from another. The average instructor has an individual voice quality that can be made pleasant to his listeners. An instructor can develop this pleasant quality by overcoming any tendencies he may have toward such things as nasality, hollowness, hardness, and throati-

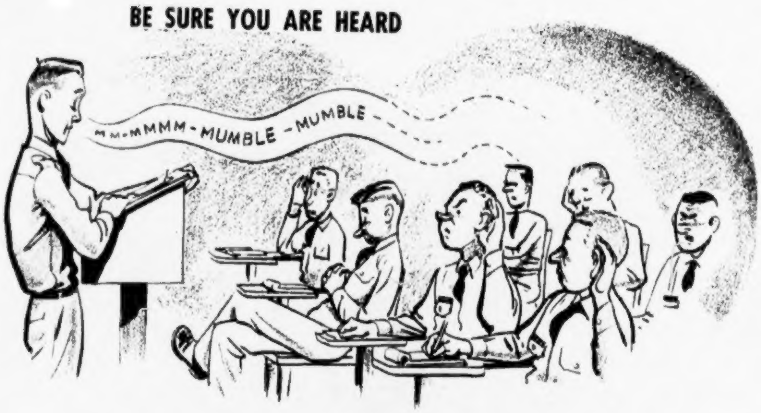


Figure 53. Voice quality.

ness. Furthermore, he should determine the pitch level at which he can speak with greatest ease and clarity, and then plan to keep this as an average pitch and vary between the limits of an easy range. This variety of pitch breaks the monotony and adds interest to the delivery.

Volume of Voice. Obviously, instructors must make themselves heard. All students in a class should be able to hear every word without difficulty. Therefore, it is necessary to speak loud enough to reach the back of the classroom. The volume of the voice should vary with the size of the class with the conditions under which the instruction must be given. Particular attention must be paid to volume when instruction is presented in the open or in a building that has poor acoustics. Observe the reactions of your students; if they are having difficulty hearing, it will be reflected in their reactions. If there is any possibility that the volume of your voice is not satisfactory, have an assistant in the rear signal to you any change required.

BEING UNDERSTOOD

Successful instruction depends on how well the class understands the instructor (fig. 54). Application of certain principles of planning and delivering presentations heightens this understanding.

Choice of Words. If the instructor is to be understood, his words must be chosen carefully and his sentences must be developed clearly and logically. The right word in the right place is the keynote of effective speech. Use terms that are common to the vocabularies of the students. It is better to oversimplify instruction than to run the risk of talking over the heads of students. The use of some complex technical terms is unavoidable, but each new term should be defined the first time it is used. Interest and color may be added to the presentation by using

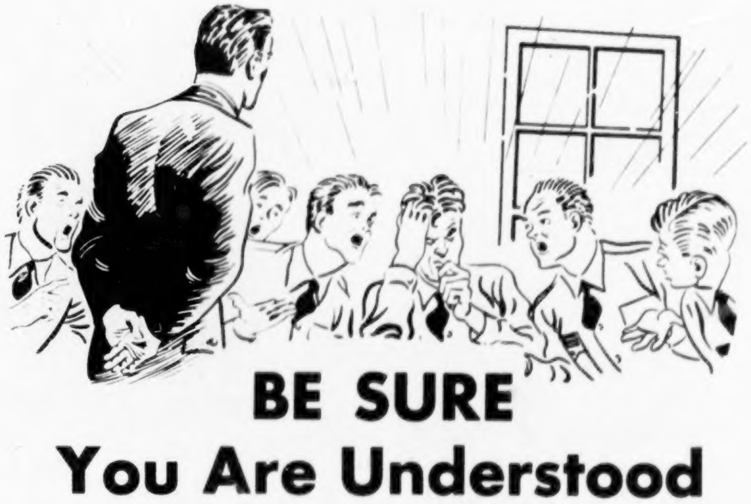


Figure 54. Being understood.

a variety of descriptive terms. A variety of connective words may be used; "and" is not the only connective in our language.

Rate of Speaking. Rate of speech should be adapted to the difficulty of the subject matter presented and to the learning ability of the class. Moreover, variety in rate of speaking is as important as change in volume. Speakers must seek variety in all aspects of their delivery. In general, if an instructor talks faster than 160 words per minute, students will have difficulty keeping up with him. On the other hand, if he talks slower than 90 words per minute, not enough will be said to hold student interest.

Pauses. Pauses provide the punctuation of speech. They should be clean and decisive, giving students an opportunity to comprehend the meaning that gave occasion for the pause. The deadly "er-r-r," "ah," or "Uh-h" in the pause is a mental crutch that instructors should not use. The deliberately used pause should not be confused with hesitation caused by uncertainty. Planned pauses are a definite part of the art of speaking.

Enunciation and Pronunciation. Instructors must speak clearly and distinctly. They must strive for clarity of expression each time they address a class. Each syllable should be pronounced distinctly and clearly. It may be necessary to enunciate more forcefully and deliberately when instructing a large group than when carrying on a conversation. It is especially desirable to enunciate each syllable of new terms, which may not be common to vocabularies of the students.

No excuses. Do not apologize or reflect an apologetic attitude (fig. 55). Do not make any comment that can be construed as an excuse for lack of preparation, lack of knowledge of the subject, lack of ability to teach it, or the conditions under which instruction must be given. Excuses only accent weaknesses, many of which will not be noticed if not pointed out to the students.

I THOUGHT IT WAS EMPTY!
MAKE NO EXCUSES

Figure 55. No excuses.

CHAPTER 12

QUESTIONING TECHNIQUES

PLANNING FOR QUESTIONS

The use of questions requires careful preparation. Planned questions should be written into the lesson plan to emphasize main points, to stimulate interest, and to insure class participation at various points. Improvised questions should be used whenever they appear beneficial. Solicitation of student questions often assists in promoting class participation. The background and experience of the class influence the use and nature of questions; however, lack of knowledge or student inexperience does not justify a failure to ask questions. The skilled instructor can obtain some degree of student participation in all teaching situations. All instructors should understand these three key questioning techniques—

Proper phrasing of questions.
Best procedure for asking questions.
Effective control of responses.

PHRASING THE QUESTION

Poorly expressed questions actually discourage active participation and serve to confuse the class. A good question should include the following:

A Specific Purpose. Questions should be designed for definite purposes. One question may be used to emphasize a major point, another to stimulate thought, and another to arouse class interest and make students more alert. A question may have as its purpose a check on immediate understanding; a later question on the same point may be asked for recall or drill. Instead of asking, "Any questions?", the instructor should be specific and relate his inquiry directly to the understanding of the subject matter just covered.

Be Understood by Students. Questions should be phrased in terms and language that are familiar to the students. The question should be expressed so that no student has difficulty in understanding what is wanted by the instructor. Lengthy questions that require clarification should be avoided. Simply worded, direct, and easily understood questions serve best.

Emphasize One Point. Avoid asking two questions in one. If a question requires several responses, distribute the requirement among several students. It is generally unsound and unfair to require one student to make a lengthy and detailed response. Dividing the requirement results in greater student participation.

Require a Definite Answer. State the question so that a definite answer is required. Do not allow students to bluff. A vague and indefinite question invites an unmeaningful response.

Discourage Guessing. Avoid questions that can be answered "yes" or "no" unless you require the students to explain their answers. Questions that strongly suggest the correct answer should not be used. Something is wrong with a question when a student's response does not reveal whether he understands the point or has merely guessed the right answer.

ASKING THE QUESTION

It is advisable to alert the class to the fact that a question is about to be asked (fig. 56). Little is accomplished by "sneaking in" questions that only a few students recognize. Although questions should be asked in a natural, interested, and conversational tone, the instructor must make sure that his question is heard by all of the class. This technique invalidates such responses as "I didn't hear the question," or "Would you please repeat the question?"

Address the question to the entire class before designating a student to answer. This holds the attention of the whole group. Each student is motivated to think and to form a tentative answer because he may be the one who is called upon. Conversely, if the instructor first names the student, the remainder of the class tends to relax as the question is being asked.

A brief pause between asking the question and calling on a student provides stimulation for student thinking.

Questions should be distributed among the whole class in order to bring as many students as possible into the discussion. Avoid calling on students in any set order or limiting questions to the most alert or superior students.

HANDLING STUDENT ANSWERS

The student must be required to address his response to the entire class and speak loudly enough to be heard by all. If necessary, cause him to repeat his response.

Students should not answer without being called upon; they should raise their hands if they want recognition.

A student answer should be evaluated according to its merit. If necessary, elaborate or have the student clarify his answer when it is

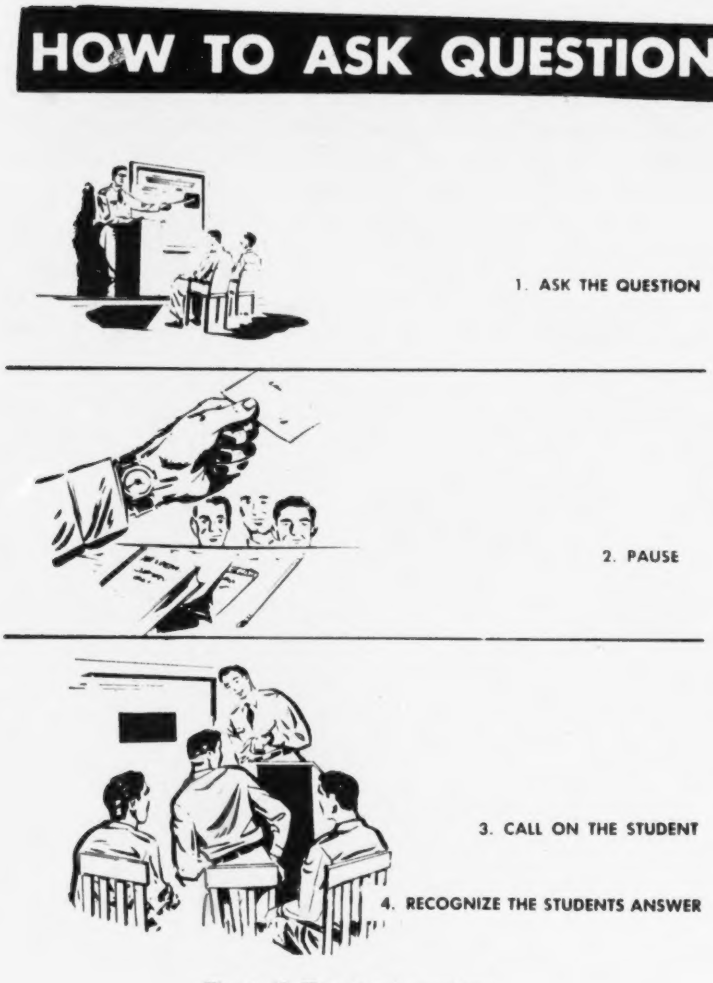

HOW TO ASK QUESTIONS
1. ASK THE QUESTION
2. PAUSE
3. CALL ON THE STUDENT
4. RECOGNIZE THE STUDENTS ANSWER

Figure 56. How to ask questions.

vague. In many instances, it is beneficial to delay final evaluation of a response until other students have given their answers. In no case should an instructor proceed from the discussion of a question or a problem without assurance that the class understands the correct answer.

An instructor should encourage students to respond to the best of their ability even though they may be uncertain of their knowledge. Do not accept "I don't know" without some effort to draw a positive response from the student.

ENCOURAGING STUDENT QUESTIONS

Encourage students to ask questions. This can be accomplished by letting students know, at the beginning, that questions are welcome. In addition, it is advisable to pause frequently during the explanation and solicit questions. The number of questions asked by students is often an indication of their interest in the subject.

An acceptable technique in obtaining maximum participation is that of relaying student questions to other members of the class.

In the event the instructor cannot answer a student question, he must not bluff. He should tell the class that he will obtain the answer and give it to them later; then he must carry out his promise.

CHAPTER 13

THE DEMONSTRATION

PURPOSE OF THE DEMONSTRATION

The demonstration is not a separate teaching method, but one to be used in combination with others. It is usually preceded and accompanied by an explanation employing either the lecture or the conference method, or both. When the demonstration is used to teach skills or techniques, it should be followed by practical work. Although the demonstration is most commonly considered as an introductory method of teaching physical skills and techniques, it can also be used to impart knowledge. The demonstration is effective in teaching because it shows—

a. How To Do Something. Skills are physical acts performed automatically. They are learned by accurate and repeated practice. In teaching, to develop skills, the demonstration serves to establish for the student a visual image of how it should be done. A demonstration that sets out to show the right way of doing a thing must be correct in every detail. Each step must be demonstrated slowly, so that the students will grasp it thoroughly. Such military skills as the disassembly of weapons consist of a series of complicated movements and must be broken down into individual steps or subtasks. Each step must be demonstrated separately and then performed by the students before the next step is considered. It may be necessary to repeat each step several times to insure student understanding. Instructors must remember that even the best students remember only a few images at a time; therefore, the number of steps demonstrated at one time must be limited.

b. Why it Works (principles and theories). An understanding of basic principles and theories is essential to the successful performance of the work involved in most technical fields. The demonstration can be used to develop this understanding.

c. How It Works (operations and functioning). In teaching the machinegun, the instructor may demonstrate functioning by using an enlarged cutaway model, or a training film that reveals the movements of component parts.

d. The Way It Is Executed (tactical movements). Here the demonstration is used to teach how to apply skill and knowledge to solutions of actual problems. The sandtable or chalkboard may be utilized, or actual tactical maneuvers may be conducted in the field. In this way, standards and procedures are established. Showing what the whole activity looks like when skillfully performed creates interest and an appreciation of ultimate standards.

e. How Men Work Together (procedures). The operation of a message center, staff procedures, and other such activities can be taught by means of demonstrations. Such demonstrations often take the form of skits or prepared exhibits. Procedures taught in this manner are realistic and specific in showing each man what he should do in his job.

A smooth, efficient demonstration produces within the students an appreciation of the skill or technique being demonstrated.

PLANNING AND GIVING A DEMONSTRATION

The physical setup for a demonstration requires special attention. It is necessary to arrange for use of equipment, tools, and related materials. If students are to perform the operation following the demonstration, arrangements must be made for conducting the practical work. Observe the following points:

Plan the Details of the Demonstration Carefully. Careful planning of the following is essential for an effective demonstration:

a. Arrange all tools and equipment to eliminate any loss of time. If they are to be moved during the demonstration, arrange them so that they can be moved quickly and quietly.

b. Insure that all students can see and hear. Consider the size of the class, the equipment to be used, and the length of the demonstration. If engine or equipment noise would obscure the instructor's voice, the instructor must not talk until the noise has subsided.

c. A lesson plan is essential to insure that the accepted technique of performing the operation is followed. This, in turn, will promote the development of exact habits and techniques in students.

d. Keep a specific purpose in mind. Demonstrate one thing at a time. Students should be able to recognize distinct breaks between the phases or steps of the activity being demonstrated. If it is necessary for students to learn more than one way of performing an operation, a separate and distinct demonstration should be given for each method taught.

Be Alert to Your Class.

a. Be sure that students can see. The instructor should position himself at one side, or behind the piece of equipment, so as not to obstruct the view. Sometimes it may be necessary to repeat a performance several times to insure that all students have seen it completed. Sometimes it may be necessary for the instructor to turn his back on the group; in this case, he should talk over his shoulder to the class.

b. The instructor must remain attentive to the operation being demonstrated and at the same time should maintain eye contact with the class. In almost every demonstration he can at least glance occasionally at the class and indicate in other ways that he is addressing the students and not the equipment.

c. Check frequently to make sure that all students understand. At the conclusion of each predetermined major step in an operation, ask questions to verify student understanding.

d. Encourage students to ask questions at frequent intervals, but only between major steps of the operation. Students should not be allowed to interrupt the demonstration of a step.

e. When equipment is being used in a demonstration, additional training aids may be helpful. For example, a large chart or model is valuable to show how to make fine adjustments on a small item. Cutaway models may be used to show the adjustment of parts concealed by a covering or housing. In demonstrations consisting of several steps or phases, it is often helpful to list each step, as it is performed, on a chart or chalkboard. This helps the students to remember steps in proper sequence.

f. A summary should be made at the completion of a demonstration. This summary should include an enumeration of all steps in the order in which they were demonstrated. Brief summaries should also be used after each individual step.

Coordinate the Explanation and Demonstration. Show how and explain how at the same time. Immediately before each step, tell exactly what you are going to do next. During the step, explain what is being done, and indicate why the step must be performed in a particular manner. Time explanations so that only short pauses occur between remarks. Eliminate awkward gaps. For example, the interest and attention of the class are diverted when a delay occurs in bringing in an item of equipment. Effective use of assistants will help in this regard. Rehearse the demonstration to check procedures and insure that every instrument or piece of equipment will function properly. Students lose confidence in instructors who experience difficulty. Blunders are distracting. If the demonstration contains a particularly difficult step that is likely to cause difficulty, acquaint the students with this fact before beginning the operation, requesting their close attention and their consideration.

Emphasize Safety Precautions. General safety precautions, rules, and regulations should be taught early in the training program. These should be reiterated and specific precautions should be pointed out during demonstrations.

CHAPTER 14

TRAINING AIDS

VALUE OF TRAINING AIDS

Training aids are essential to effective instruction (fig. 57). In the hands of good instructors they are powerful tools. Just as do skilled craftsmen, instructors must know how to make the best use of the tools of their profession. They must be expert in the selection, procurement, construction, and use of training aids. Good instructors use training aids because they recognize their true value. Effective use of training aids helps the instructor to—

Develop Understanding. Most important of all the reasons for using training aids is that they make it easier for students to learn. Good aids simplify, add emphasis, and help to clarify difficult points of subject matter.

Appeal to the Senses. Learning begins with stimulation of the senses. The more senses involved in a learning process, the more likely it is that learning will take place. By using training aids, instructors are able to reach the minds of men through more than one sense channel.

Save Time. Training aids not only enable students to learn more effectively, but also help them to learn faster. It would be impossible to teach most Army subjects in the time allotted without the use of aids.

Interest the Student. Training aids add interest and vitalize instruction. They focus the student's attention upon the lesson being presented. When properly used, they add variety to the presentation. In many training situations the fact that the actual object, a model, or a training film is used adds realism to the subject, thus providing a means of motivation that helps maintain the student s state of readiness for learning.

SELECTION OF TRAINING AIDS

There are many types of training aids; each has advantages and limitations, depending upon the mission of the lesson and the nature of the subject matter. Frequently it is necessary to select more than one

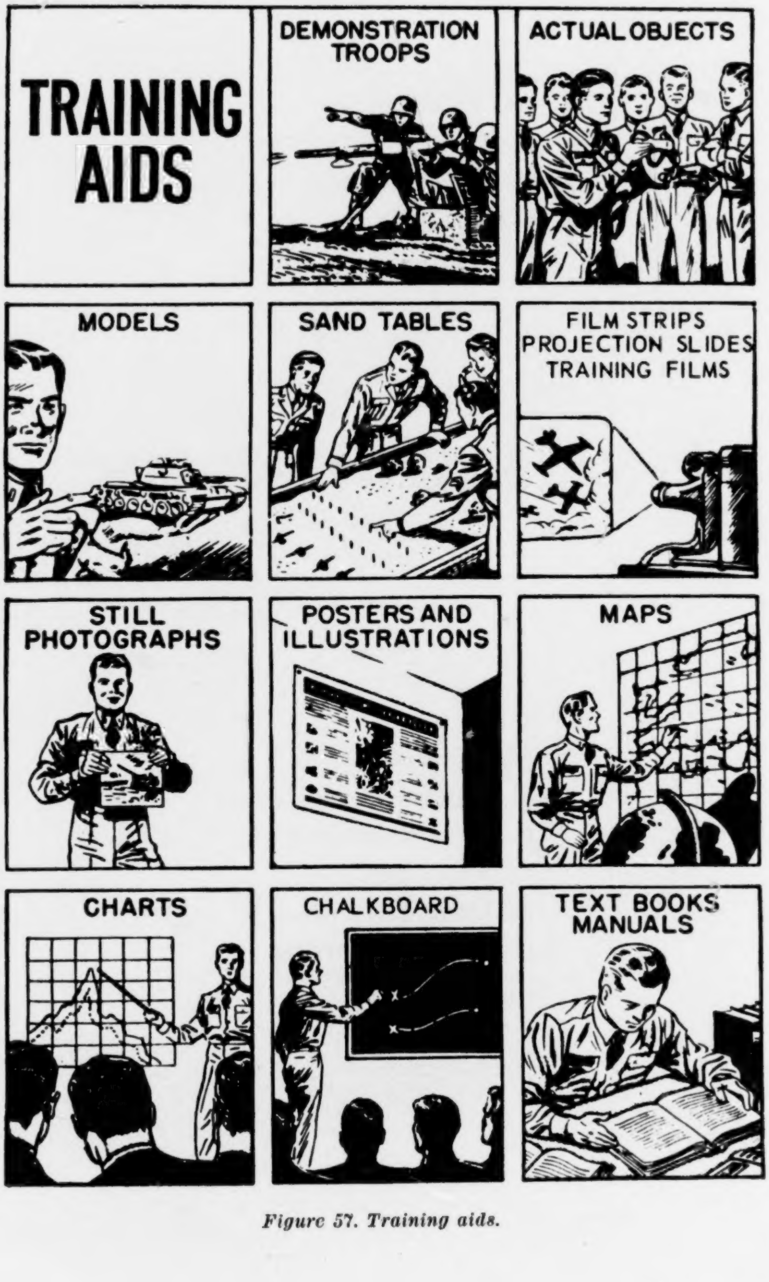
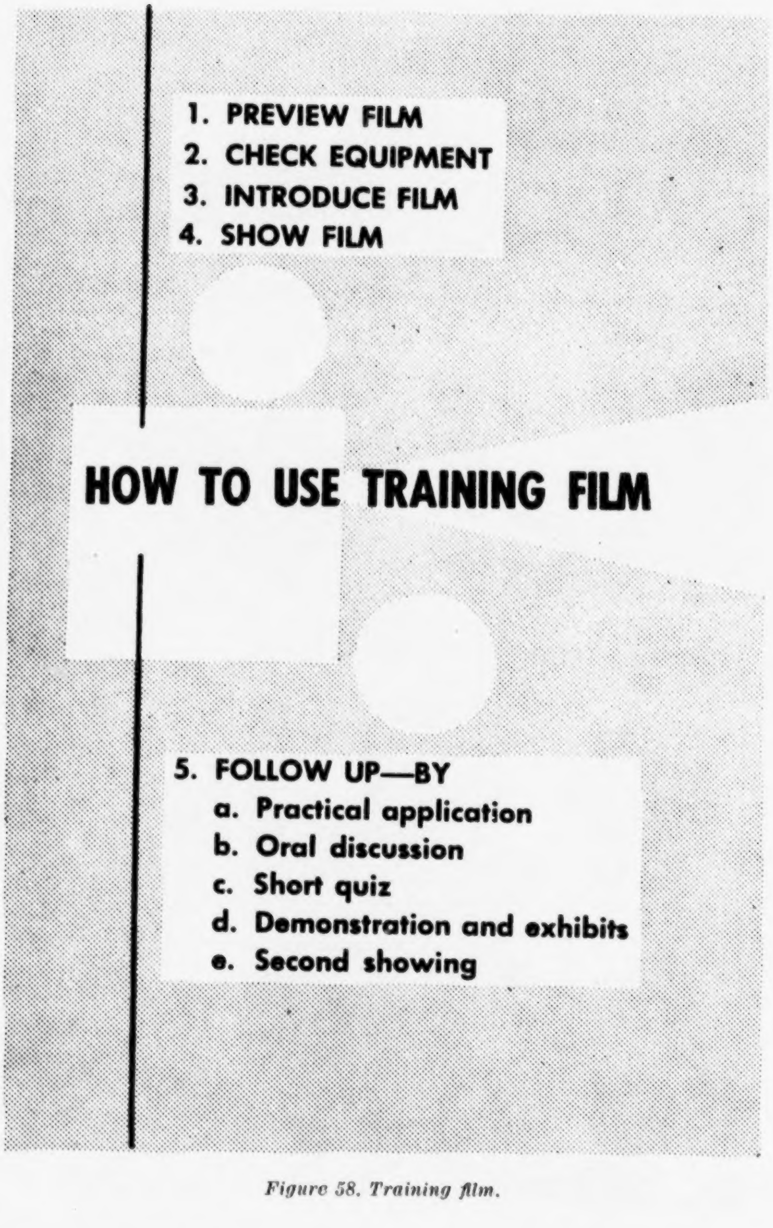

TRAINING AIDS
DEMONSTRATION TROOPS
ACTUAL OBJECTS
MODELS
SAND TABLES
FILM STRIPS
PROJECTION SLIDES
TRAINING FILMS
STILL PHOTOGRAPHS
POSTERS AND ILLUSTRATIONS
MAPS
CHARTS
CHALKBOARD
TEXT BOOKS
MANUALS

Figure 57. Training aids.



1. PREVIEW FILM
2. CHECK EQUIPMENT
3. INTRODUCE FILM
4. SHOW FILM

HOW TO USE TRAINING FILM

5. FOLLOW UP—BY
   a. Practical application
   b. Oral discussion
   c. Short quiz
   d. Demonstration and exhibits
   e. Second showing

Figure 58. Training film.

type of aid in order to present a lesson effectively. Instructors should constantly examine the subjects they teach with a view toward developing additional training aids that will help the student to learn.

FABRICATION OF TRAINING AIDS

Some of the best training aids are those constructed by instructors. In many cases, these aids can be made simply and inexpensively from scrap lumber, wrapping paper, or salvaged materials. Such salvaged items as motors, communication equipment, and vehicles furnish valuable materials for training aids.

Transparencies for Overhead Projector (*fig. 59*). The overhead pro-

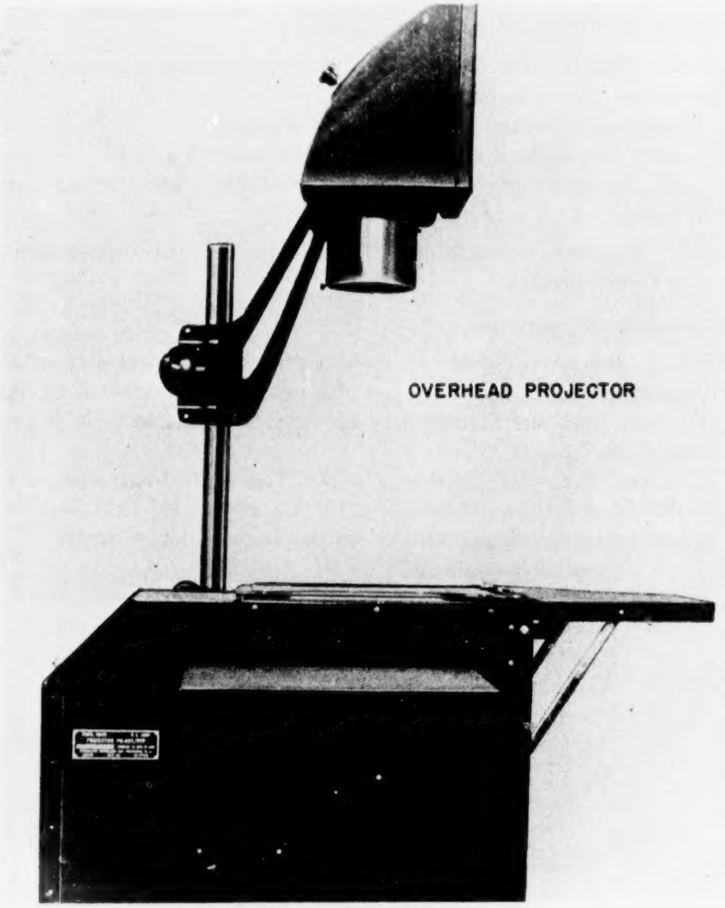


Figure 59. Overhead projector.

jector, which projects large transparent slides onto a screen or flat wall surface, is widely used by the Army and is available through film libraries. Among its advantages is the fact that it can be used in a lighted and ventilated room, permitting students to take notes. Another advantage is that the instructor himself operates the projector while facing the class, thus maintaining eye contact with the students. A wide variety of transparencies are available from service schools and training aids centers and subcenters.

Material for Projection by Opaque Projector. Pictures, maps, or pages from field manuals up to 8 inches by 10 inches can be projected on the opaque projector. Material may be mounted on pieces of cardboard to facilitate its positioning in the projector. One disadvantage of using the opaque projector is that there must be total darkness if an effective image is to be projected.

Maps, Charts, and Diagrams. In preparing these training aids, remember the following points:

Be sure that each chart has a title or caption.

Maps should show a scale and include a north arrow.

All charts should be visible and readable from the rear of the classroom.

Make important parts stand out. Use color, underlining, and various weights of lettering.

Include only essentials.

Use an opaque projector to make true-scale enlargements of small illustrations and maps. Project the subject onto a sheet of paper, and then trace the projected image with a pencil to make a professional-looking aid.

Sandtables and Terrain Models. There are many uses for the sandtable and the terrain model. A few of the subjects that can be taught on the sandtable or any similar terrain device are—

Combat formations.
Patrolling.
Terrain analysis.
Tactics.
Mapreading.
Fire adjustment.
Communication.
Supply installations.
Traffic control.

TECHNIQUES IN USE OF TRAINING AIDS

To be of maximum value, training aids must be skillfully employed. The instructor must follow these guidelines.

Select the Appropriate Aid. Before selecting or constructing aids for a unit of instruction, review the lesson thoroughly to determine the points that need illustration. Then select or construct aids that will best enable you to put these points across. In selecting aids, keep in mind the chief reason for using training aids: to help students learn the subject quickly and easily.

Prepare for the Use of the Aid. Be completely familiar with the aid. Be prepared to answer any questions concerning it. One of the best ways to prepare for the use of the aid is to rehearse the lesson several times using the aid as it is to be used in the actual presentation.

Explain the Aid to the Class. An elaborate aid may be used to illustrate highly complicated and technical subjects. When such an aid is first shown to the students, give a brief explanation of its overall purpose or function. Otherwise, students will attempt to find their own explanation of the aid and miss part of your presentation.

Keep Aids Covered When Not in Use. Large charts can be covered by the simple expedient of tracking or stapling sheets of wrapping paper over them. If the chart contains lines of printing, strips of paper can be cut to the size of each line. Machinery, weapons, and similar aids can be covered with target cloth or some like material. This will prohibit the aid from distracting the student's attention while not being used.

Show Aid So That All Students Can See It. When using a training aid, display it so that every student in the class can see it. Check the view from the rear of the classroom to make sure that all students can see the aid.

Do Not Obstruct the Student's View of the Aid. Do not stand in front of the aid; do not put it behind the lectern.

Talk to the Class, Not to the Aid. When explaining a chart or chalkboard drawing (fig. 60), stand near the side of the aid; this will help eliminate any tendency to talk to the aid rather than to the class. When drawing on the chalkboard, finish the drawing quickly, and then face the class and explain the point.

Use a Pointer. In most instances, a pointer is useful in focusing student attention on a particular part of the training aid. When using the pointer, hold it steady on the part of the aid you want the class to observe. Holding the pointer in the hand nearest the aid will enable you to maintain better eye contact with the class. Put the pointer away when it is not needed; it is easy to acquire distracting mannerisms with a pointer that is not being used.

Use Assistants to Best Advantage. If you use assistant instructors, make sure that they are well-rehearsed so that they will know exactly what they are to do and when they are to do it. If an assistant is to show projected aids, prearrange signals so that he will know when to change slides or cut off the machine.

132

HOW TO USE THE CHALKBOARD

1. CHECK ON EQUIPMENT TO BE USED.
2. CHECK FOR GLARE.
3. KEEP CHALKBOARD CLEAN.
4. PLAN YOUR WORK IN ADVANCE.
5. KEEP MATERIAL SIMPLE AND BRIEF.
6. PRINT AND DRAW LEGIBLY.
7. USE COLOR FOR EMPHASIS AND VARIETY.
8. DON'T CROWD YOUR WORK.
9. ERASE UNRELATED MATERIAL.
10. PREPARE COMPLICATED ILLUSTRATIONS BEFOREHAND.

Figure 60. The chalkboard.

Display Aids Smoothly. When using three or four large charts or sliding boards, number the boards in the order in which they are to be used. If heavy equipment must be brought in during the class, make sure that it can be moved in without undue disturbance.

CHAPTER 15

APPLICATION

APPLICATION IN THE TEACHING PROCESS

Active student participation throughout the lesson is highly desirable. Instead of relying upon separate practical work periods following explanations and demonstrations, the instruction should integrate explanation, demonstration, and application in each step of teaching a skill or procedure. The nature of the skill and the actual situation will dictate the appropriate technique and the sequence of applicatory methods.

Instructors must recognize the importance of using classroom "pencil-and-paper" exercises in addition to the conventional practical work periods. The teaching flexibility afforded by the use of these exercises should not be overlooked.

HOW SKILLS AND TECHNIQUES ARE LEARNED

In the application stage, soldiers develop physical or mental skills and techniques or learn how to solve problems. The learning phases of these processes (fig. 61) are as follows:

Building a concept of the skill—learning of what the skill consists. This is usually accomplished by—

Demonstration.

Explanation.

Directing students to other sources of information, such as study assignments, instructional sheets, and similar references.

Developing the skill.

The student imitates the demonstration.

His activities are directed.

The instructor evaluates progress and encourages the student to evaluate his own progress.

Practice for accuracy and speed and to make the act of procedure automatic.

BASIC METHODS IN THE APPLICATION STAGE

There are several method of employing application. The best method to use depends on the students' state of training and the skill being learned.

134

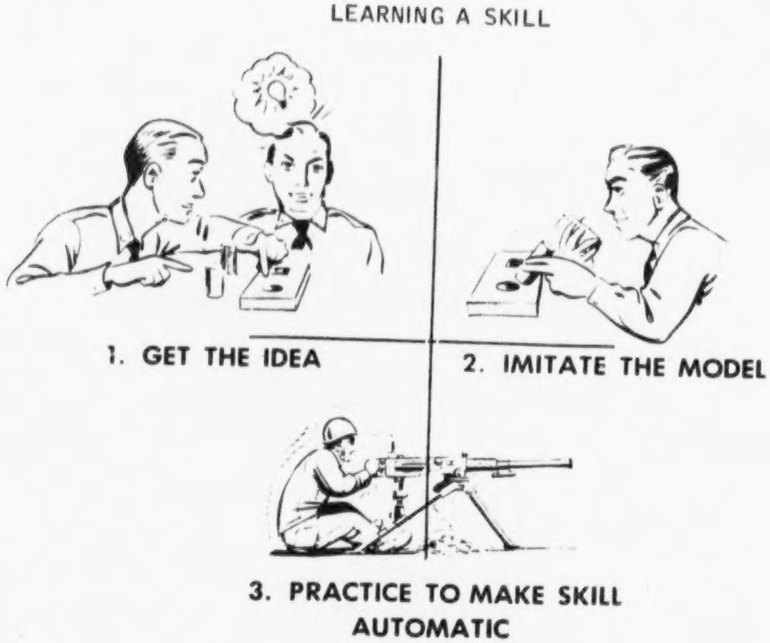


Figure 61. Stages of learning a skill.

Controlled Practice Method (*Group Performance*).

a. In controlled practice (fig. 62), all men in a class do the same thing at the same rate and at the same time, under the supervision of instructors. The steps in this method are—

(1) Explain and demonstrate a step in the procedure while students observe.

(2) Talk the students through an imitation of the demonstration.

(3) Correct errors.

b. This procedure is applied to each step until the operation is covered completely. Initial application in most skills and operations, such as the disassembly of weapons, can best be taught by the controlled practice method.

c. Controlled practice affords maximum control and observation of student activities, facilitating on-the-spot correction of errors in the imitation step. Clear directions are essential. For example, at the beginning of a lesson on the disassembly of a weapon, the instructor should tell the class that—

(1) He will explain and demonstrate the process of disassembly step by step.

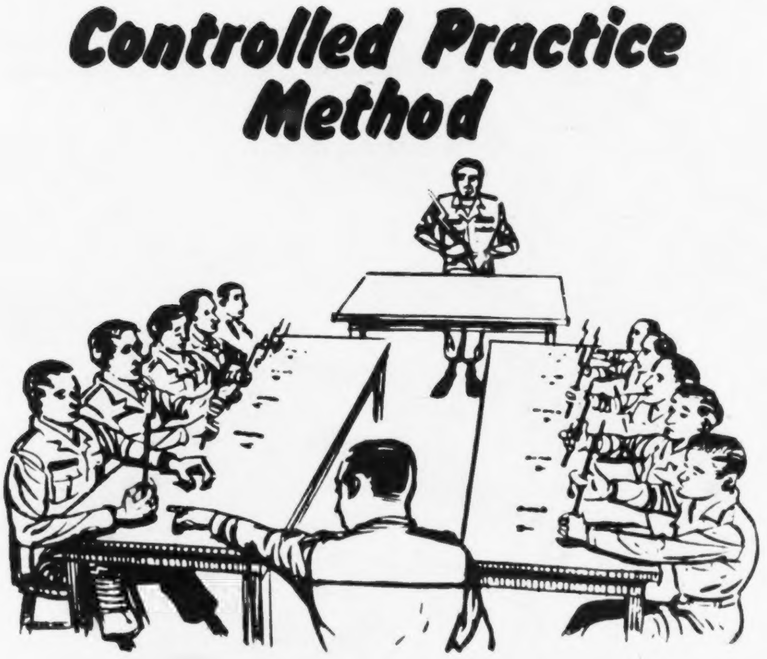


Figure 62. Controlled practice method.

(2) Students are to give careful attention to the explanation and demonstration.

(3) Students are not to perform the step until after the explanation and demonstration and then only when the instructor tells the entire class to start.

(4) Students are to perform only the step demonstrated and are at no time to get ahead of the instruction.

d. Controlled practice is especially suited to the first two steps in learning a skill: gaining the concept and perfecting the movement pattern. The last step, making the skill automatic, must be carried on by a method that does not limit the student's independent practice.

Independent Practice Method (*Fig. 63*). This method allows the student to work at his own rate of speed and to perform an operation as a whole. Through independent practice he can establish the skill so that it becomes automatic. The student works at his own speed, without control but with supervision.

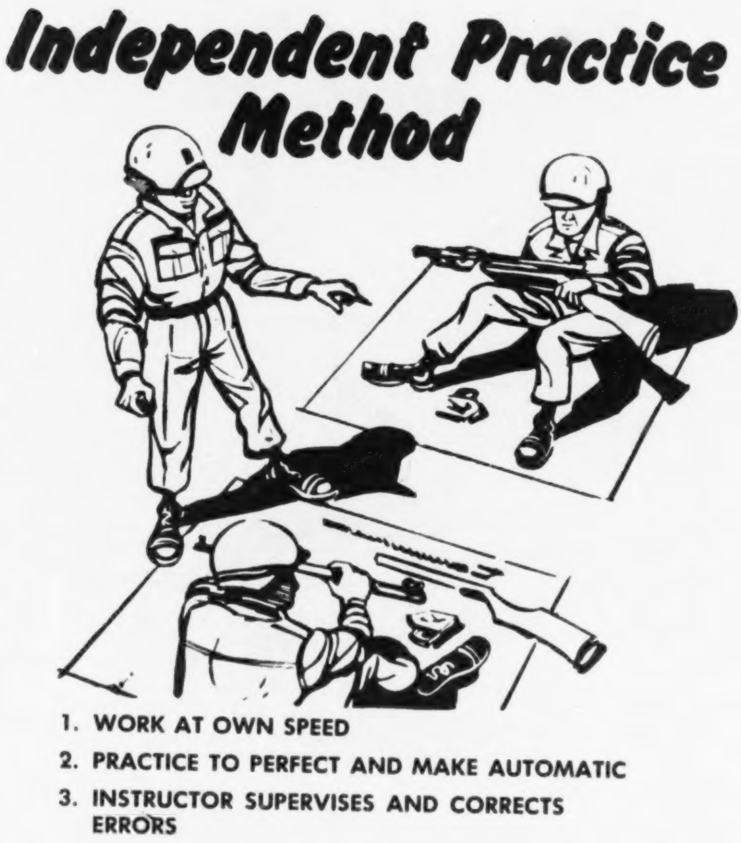

Independent Practice Method
1. WORK AT OWN SPEED
2. PRACTICE TO PERFECT AND MAKE AUTOMATIC
3. INSTRUCTOR SUPERVISES AND CORRECTS ERRORS

Figure 63. Independent practice method.

Coach and Pupil Method (*Fig. 64*). This method is used for teaching students who have mastered the basic fundamentals of a skill. Students are paired off and act alternately as coach and pupil under direction and supervision of the instructor and his assistants. Properly used, this method will cause students to think as well as do; it will help develop initiative, reliance, and skill in giving directions and commands. It lends itself to the teaching of such subjects as bayonet practice, unarmed defense, first aid, and marksmanship.

Team Practice (*Fig. 65*). In the application stage the student should be trained first as an individual and then as a member of a team, such as a tank crew, a rifle crew, a rifle squad, or the crew of a crew-served weapon. Team practice exercises, in which students serve as team mem-

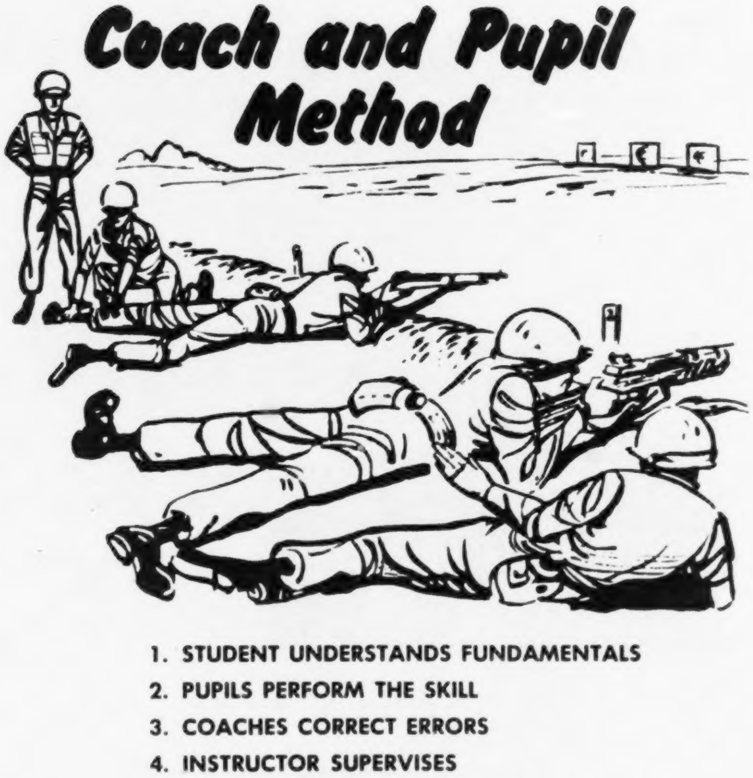

Coach and Pupil Method
1. STUDENT UNDERSTANDS FUNDAMENTALS
2. PUPILS PERFORM THE SKILL
3. COACHES CORRECT ERRORS
4. INSTRUCTOR SUPERVISES

Figure 64. Coach and pupil method.

bers, are normally conducted in two phases: first, a walk-through-by-the numbers practice in which techniques are emphasized; second, opportunities to apply these techniques in a realistic situation.

First Phase. In the walk-through-by-the-numbers phase, only team fundamentals should be stressed. To introduce simulated battle conditions too soon and too suddenly will tend to obscure the learning of fundamentals. Instructors should make on-the-spot corrections.

Tactical Phase. As teams master fundamentals, applicatory exercises should be expanded in scope so that all phases of combat operations are included. A variety of individual subjects should be fitted together into a single training period; conditions and requirements should be varied so that team members will develop judgment and facility in applying skills and techniques to solutions of new and varied tactical problems.

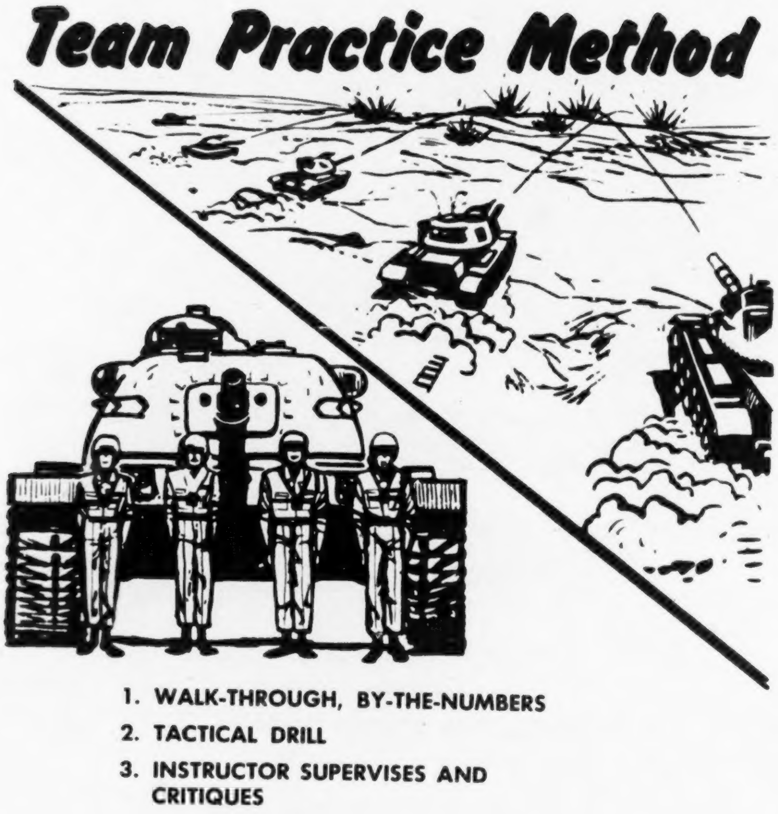

Team Practice Method
1. WALK-THROUGH, BY-THE-NUMBERS
2. TACTICAL DRILL
3. INSTRUCTOR SUPERVISES AND CRITIQUES

Figure 65. Team practice method.

GENERAL CONSIDERATIONS FOR PRACTICAL EXERCISES

Several general considerations in planning and conducting all types of application help the instructor to anticipate many problems and plan a more effective application stage.

Students Must Be Motivated To Learn. Learning will result in the application stage if understanding of the principles or techniques taught is developed by effective instruction in the presentation stage, and if students are motivated to put these principles or techniques into practice. Motivation, in the application stage, can be accomplished in the following ways:

Set Definite Objectives. Be sure that the student knows what he is to do and why it is important. Be sure that the exercise emphasizes a few simple principles, rather than a number of complex situations that may confuse the student. State objectives in terms of student behavior rather that subject matter; for example, "determining direction" will motivate student performance more than "mapreading, azimuth, and declination."

Evaluate Progress. Knowledge of one's progress is a very effective incentive. At appropriate intervals, inform the student of the quality of his performance. If it is satisfactory, the feeling of accomplishment spurs him to further effort; if it is unsatisfactory, he becomes conscious of the need to improve and will usually strive to improve his record. Judicious praise stimulates the learner, but commendation should not be used to the extent that it becomes ineffective.

Use Competition. In application there are many opportunities for the use of competition. Students may compete individually or in groups against their past records, with each other, or with standards set by the instructor. Competition, properly conducted, motivates students to wholehearted effort.

Vary Procedures. Variety is the enemy of monotony. One of the best ways to overcome the drudgery of a long practical work period is to vary the procedures employed.

Make Application Realistic. Strive for realism in the application stage whenever the activity is such that realism is an important element. This motivation technique is best used in team performance activities. Some individual types of application—such as use of the compass, preparing individual field fortifications, and tactical training of the individual soldier—make wide use of realism to motivate learning.

Be Sure That Practice Does Make Perfect. Soldiers will do in combat about the same things they do in training; their performance must be perfected in the practical exercises of the training program. In order to set up applicatory exercises that will enable students to approach perfection, the instructor must consider the following principles:

Make a Correct Start. The most common procedure for giving the learner a correct start is to demonstrate the act to be performed and then let him practice it. The group performance method is especially effective in making a correct start.

Provide Practice or Drill Exercises. Exercises should provide for repetition. Single out a specific habit for isolated practice; for example, practice in tackling in the training of a football team. When a series of specific habits is needed in the performance of an act, exercises for each habit should be provided, and these habits should be practiced together in an exercise that closely approximates a real situation. The number of exercises should vary with the difficulty of the response desired.

Employ Problem-Solving Techniques. These will be especially valuable in team performance exercises and in situations where students have developed some skill through practice. The use of problems will serve to motivate the student and will make instruction more realistic.

Keep Achievement Standards Progressive. In initial applicatory exercises, the student should perform each step thoroughly and accurately under close supervision. In succeeding exercises, standards should be raised progressively—better and faster work should be required—and less assistance should be given. Merely to repeat an activity has little value unless higher standards are set. Students must be made to realize the progressive nature of their practical work or they will feel that the exercise is something designed merely to keep them busy.

Keep Conditions Realistic. Keep conditions of the applicatory exercise as nearly as possible like those that would be encountered in battle or other actual use. In initial exercises, however, it is often more important to provide ideal conditions than to insist on realism, so that the student can learn to perform correctly; realistic conditions can be introduced in succeeding exercises.

Skills and Techniques Should Be Applied As Taught. Perfection is achieved through practice only if the student practices the right movements and procedures. The instructor must make sure, through careful supervision, that the student practices the skill or technique correctly.

Indirect Assistance Is Best. The initiative and resourcefulness so necessary for success in battle can be developed in the application stage only if instructors train men to depend on their own abilities in the solution of problems. Instructors must prevent the formation of faulty habits, but at the same time they must encourage soldiers to use their own resourcefulness. After the initial applicatory exercises, most assistance should be indirect.

Constant Supervision Is Imperative. The fact that students are busy is not a guarantee that learning is taking place. The instructor must insure that he can give affirmative answers to these questions--

Do the students know the what, how, and why of the activity?
Does the activity contribute to the realization of the objective?
Are the students performing according to instructions?
Is maximum use being made of equipment, materials, and personnel?
Are safety measures being observed?
Is ample time provided for proper completion of the performance?
Are the students constantly improving?

Each Step Must Be Learned Before Moving to the Next. Do not introduce too many operations, procedures, principles, or problems at any one time. Introduce a few learning activities; provide for adequate practice; review and critique the material taught and practiced; examine the student's work; and then, if the student is proficient, proceed to the next stage.

CHAPTER 16

PREPARATION FOR INSTRUCTION

STEPS IN PLANNING THE LESSON

General. The effectiveness of instruction will depend upon how well the instructor has selected his teaching points, adapted his material to the special needs, abilities, and interests of the class, arranged for equipment and materials needed, planned for learning activities, and anticipated problems peculiar to the subject. Many instructors feel that there is never enough time for adequate planning; one solution to this problem is to use a systematic procedure in the preparation of a lesson. Such a procedure is presented below as steps in planning the lesson—

Make an estimate of the situation.
Select and organize subject matter.
Make a lesson plan.
Rehearse.
Make a final check.

Make an Estimate. The estimate, when applied to lesson planning, is primarily a process of anticipatory thinking wherein the instructor compares the various solutions to instructional problems. Although this estimate is a logical first step in planning, it is also a continuous process and is often continued right up to the presentation of the lesson. Some of the factors to be considered in the estimate of the instructional situation are—

a. Mission. This is actually the starting point for all planning activities. The mission can be obtained from programs of instruction, subject schedules, or training memorandums. The mission should be specifically stated in terms of the learning to be developed rather than in broad, general statements. The first step the instructor should take in planning a lesson is to write out the lesson objectives so that the mission will be clearly defined.

b. Analysis of the Subject. After determining specific objectives, the instructor decides what skills, knowledge, or techniques the student must learn for successful performance. In making an analysis all

142

essential procedures, facts, and principles of the particular job under consideration are studied. These become the teaching points of the lesson.

c. Equipment, Facilities, and Training Aids. The instructor must consider the requirements for, and availability of, training aids, equipment, training areas, and facilities. Advance notice is required to obtain training films from film libraries and graphic aids from training aids centers. Frequently instructors must improvise, and this usually takes time. Last minute arrangements for training aids or equipment usually result in slipshod instruction.

d. State of Training. In considering this factor, the instructor must review training schedules and other sources to determine what previous training and experience the men have had. With this information, he can better coordinate his own unit of instruction with other phases of the training program. It enables him to plan an effective approach to his subject which will meet the specific needs and the background of the students.

e. Time Available. If time is short, subject matter must be limited to the items essential for accomplishment of the lesson objectives. If time is available, more class participation can be used and more supporting material can be included. Lack of time cannot justify poor instruction; the instructor must consider the time available and plan to use that time effectively.

f. Instructors Needed. What instructors and assistants will be needed? What training will these men need? These questions must be answered in the early phases of the preparation stage.

g. Training Conditions. The instructor must consider the conditions that will affect his presentation. Seasonal changes in weather may necessitate moving classes indoors. The instruction must be flexible enough to remain effective when obstacles to training arise. The basis of such flexibility is careful planning.

h. Every Problem Anticipated. This should be the instructor's goal in his estimates. He must attempt to anticipate all problems that might arise during this lesson and must plan to solve them. He should consult with instructors more experienced than he, if possible, since experience is particularly valuable in this phase of the estimate.

Select and Organize Material.

a. In selection and organization of subject matter for a lesson, the instructor first studies reference materials and acquires a broad background of information on the subject. He becomes thoroughly familiar not only with what will be presented to his class, but also with material related to the subject. After study and research, he selects the information that he will present in the lesson, based on the analysis made in his estimate of the instructional situation. He particularly looks for illustrations, historical examples, and stories that might make the presentation more interesting and meaningful to his students.

b. Next, he considers the order of presentation, or organization. The order must be logical and progressive from the student's point of view.

c. One effective way to organize a subject is to select a problem, a hypothetical illustration, or an historical example as a "vehicle" to carry the teaching points. For example, a lesson on patrolling might be taught by discussing a hypothetical patrol action, using maps and other training aids, and then asking the students to point out the tactical principles that were applied or violated. This method makes teaching points vital and interesting; it emphasizes the application of the material being taught and presents knowledge from the standpoint of how it will be used.

Make a Lesson Plan. As a result of his study and research, the instructor has notes that must be put into a usable outline; this outline is the lesson plan. Good lesson plans are material evidence of careful preparation. Instructors must remember that their lesson plans may be used by others as well as by themselves and, therefore, must insure that their plans are clear and complete.

a. Purpose of the Lesson Plan. The purpose of the lesson plan is to insure that the lesson will be complete. It shows what material is to be taught, in what order it is to be taught, and exactly what procedures will be used. Each lesson plan is an outline of one segment of a course.

b. Use of the Lesson Plan. The lesson plan is not a crutch. The instructor will seldom hold the plan in his hand, but will keep it available at all times for quick reference. He should not read from it except perhaps in giving a quotation or details of highly technical material.

Rehearse the Lesson. A rehearsal of each new lesson provides a final check on the instructor's plan.

a. Rehearsals should be complete in every regard. Instructors must make a practice of using the indicated training aids, performing the scheduled demonstrations, and following the order of presentation. If application or examination is used, it should be checked during the rehearsal. The physical setup should be as nearly that of the actual situation as possible.

b. Assistant instructors must be present and rehearse their duties as they are to perform them during the actual presentation.

c. An audience should be present, consisting of one or more persons of rank superior or equal to that of the instructor. Such persons can offer valuable, constructive criticism on such points as the instructional material, choice of words, rate and volume of speech, and effectiveness of questions and demonstrations.

d. Rehearsals for demonstrations must be repeated until each step is performed easily and timed properly.

Make a Final Check Prior to Class. Just before the instruction is presented, the instructor and his assistants must insure that everything is ready for the lesson.

a. Is the necessary equipment on hand?

b. Is the physical setup properly arranged? (tables, chairs, benches, equipment, ventilation, and lighting)?

c. Are all instructional materials for students' use at hand (reference materials, mimeographed materials, manuals, assignment sheets, worksheets, and tests)?

d. Are all assistants present and do they understand their duties?

e. Have all training aids been procured and properly arranged for use?

f. Are the lesson plan and notes available for use during the lesson?

MAKING THE LESSON PLAN

The Lesson Plan Form. A lesson plan consists of two major parts: the heading and the lesson outline. A form that can be used in most situations is shown in figure 66.

a. Heading. The heading lists the title, time, method, training aids, references, and other essential information.

b. Lesson outline. The lesson outline portion of the plan outlines the subject matter together with the teaching procedures to be used.

Making the Lesson Outline. In setting up the lesson outline, it is desirable to "block" each paragraph and subparagraph instead of returning all lines after the first to the left margin (fig. 67). This makes the plan neater and keeps single words from appearing on the left of the page.

a. Use correct designation of topics. A standard method of designating topics (paragraphing) in the outline is essential to clarity, standardization, and ease of use. An approved method is illustrated in figure 67.

b. Select main points and subtopics. The main points in the lesson outline are the teaching points of the lesson—the points that the student must learn if he is to fulfill the requirements established by the instructor. These points should be mutually related, coordinated, and arranged progressively. Supporting or explanatory subtopics should be related to the main point and helpful in developing its meaning. Subtopics are related to the main points by such terms as "that is," "for example," and "for." These terms are understood and not written into the outline.

LESSON PLAN

INSTRUCTIONAL UNIT: (What is the subject to be presented?)

TYPE: (Which methods will be used? Lecture, conference, demonstration, practical exercise.)

TIME ALLOTTED: (How much time?)

CLASSES PRESENTED TO: (Who will receive the instruction?)

TOOLS, EQUIPMENT, AND MATERIALS: (What items will the instructor need to supply to the students for his class?)

PERSONNEL: (What assistant instructors are needed?)

INSTRUCTIONAL AIDS: (What training aids will be required? Detailed description of aids may be put into an annex to the plan.)

REFERENCES: (Where is the subject matter for this lesson found?)

STUDY ASSIGNMENTS: (What should the student study before coming to class?

STUDENT UNIFORM AND EQUIPMENT: (What should the student bring to class? How should he dress?)

TROOP REQUIREMENTS: (Will troops be required?)

TRANSPORTATION REQUIREMENTS: (Will transportation be needed?)

Note. Place in the heading of the lesson plan all information regarding preparation necessary for the conduct of the lesson. Do not omit elements of the heading; if they do not apply, write None. The heading serves as a checklist for the preparation stage.

1. PRESENTATION: (State method and time required.)

a. Introduction. (Time required.)

Note. If some special technique is used to gain the attention of the class, such as a demonstration or skit, put it into your lesson plan as a NOTE.

(1) Objective. Give the objective or purpose of the instruction.

(2) Standards. If specific standards are required in the lesson, tell the students what is expected of them.

(3) Reasons. Give the student reasons for learning this lesson. Stress its importance.

(4) Other elements that may be outlined in the introduction.

(*a*) Review of previous instruction.

(*b*) Procedure to be followed in this unit.

Note. These elements in the introduction may be outlined in any order that seems best for the presentation.

Figure 66. From for lesson plan.

b. Explanation and/or Demonstration. (Time required.)

(1) All *main* points of the presentation should be designated (1), (2), (3), etc.

(2) When notes, training aids, questions, and other instructional procedures supplementary to the lesson are used, they are put into the plan as follows:

QUESTION: What are the limitations of the light-gun tank?

Note. Use chart No. 7.

ILLUSTRATION: Draw circuit diagram on chalkboard.

CAUTION: Be sure driving spring rod slot is in vertical position and locked in bolt.

EXAMPLE: Combat story of poorly planned patrol action.

SUMMARIZE: First three points covered.

(3) If a demonstration is used:
- (*a*) Outline in a proper order the steps of the procedure.
- (*b*) Include in the outline:
  - *1.* Questions to check understanding.
  - *2.* Notes on use of equipment.
  - *3.* Notes on safety precautions.

Summary. (Time required.)

Note. Summary should be used here if the unit includes application and/or examination. When the lesson includes only presentation and review or critique stages, use the summary in the review or critique stage.

(1) Review main points.

(2) Re-emphasize important items and safety precautions.

2. APPLICATION: (State method and time required.)

a. Outline in Detail.
- (1) Directions to students.
- (2) Arrangement of students, requirements, and material.
- (3) General plan for conduct of the practical work.
- (4) Practical exercises, if any, in an annex to the plan.

b. Outline of Instructor's Activities.
- (1) Supervision.
- (2) Procedure to be followed.
- (3) Safety precautions to be observed.

Figure 66—Continued.

3. EXAMINATION: (State method and time required.)

a. *Written Tests.* Include complete test with directions in an annex to the plan.

b. *Oral Tests.* Include questions to be asked.

c. *Observation of Student Work.*

  (1) List specific points to check.

  (2) Indicate how to rate or score the students.

4. REVIEW OR CRITIQUE: (State method and time required.)

a. Clarify points of difficulty by asking students if they have any questions.

b. Summarize the lesson.

  (1) Recap points covered.

  (2) Outline these main points in the plan.

c. Close with a strong statement. Outline in detail or write out.

Note. A lesson that does not contain application or examination stages will number only those stages employed and omit the others. In the case of a lesson that employs only one stage of instruction, the main divisions of the outline will be:

1. INTRODUCTION; 2. EXPLANATION; 3. SUMMARY.

Figure 66—Continued.

OUTLINE FORM

1. FIRST MAIN IDEA BEING OUTLINED.
  a. Fact, opinion, or evidence supporting this idea.
    (1) Important item relating to *a.*
    (2) Another item relating to *a.*
      (*a*) Subordinate data in support of (2).
      (*b*) More data in support of (2).
        1. Item to support (*b*).
          (a) Subtopic supporting *1.*
          (b) Another item supporting *1.*
        2. Another item in support of (*b*).
      (*c*) Another point supporting (2).
  b. Another fact supporting 1.
2. SECOND MAIN IDEA BEING OUTLINED. Equal to 1 above.
  a. Fact supporting second main idea.
    (1) Item explaining *a.*
    (2) Second item explaining *a.*
  b. Second fact supporting second main idea.

Figure 67. Outline form showing designation of topics.

148

CHAPTER 17

EVALUATION

GENERAL

"How am I doing?" Both the instructor and his students need an answer to this question. And the question needs to be asked and answered periodically. Evaluation is an essential phase of the instructional process and includes a variety of devices and methods that the instructor uses to keep himself and his students informed of their progress. Some of these methods of evaluation were described in earlier sections of part four, such as oral questions to check student understanding during the presentation phases of instruction and on-the-spot correction of errors during the application phase. This form of evaluation, informal and immediate, is an integral part of the teaching process; for maximum learning it must not be separated from the presentation and application phases of instruction. This chapter deals with another form of evaluation—achievement testing. The primary purpose of this form of evaluation is to measure student retention of the knowledge, skills, abilities, and attitudes required for job proficiency.

WHY GIVE TESTS

The use of tests in Army training accomplishes four major purposes (fig. 68).

Tests Aid in Improving Instruction.

a. Discovering Gaps in Learning. Properly constructed tests reveal gaps and misunderstandings in student learning. If frequent tests are given, such weaknesses can be discovered and corrected by reteaching the material.

b. Emphasizing Main Points. A test is a valuable teaching device; students tend to remember longer and more vividly those points that are covered in an examination. Tests encourage students to review what has been taught.

c. Evaluating Instructional Methods. Tests measure not only student performance but also instructor performance. By studying test results, instructors can determine the relative effectiveness of various methods and techniques.

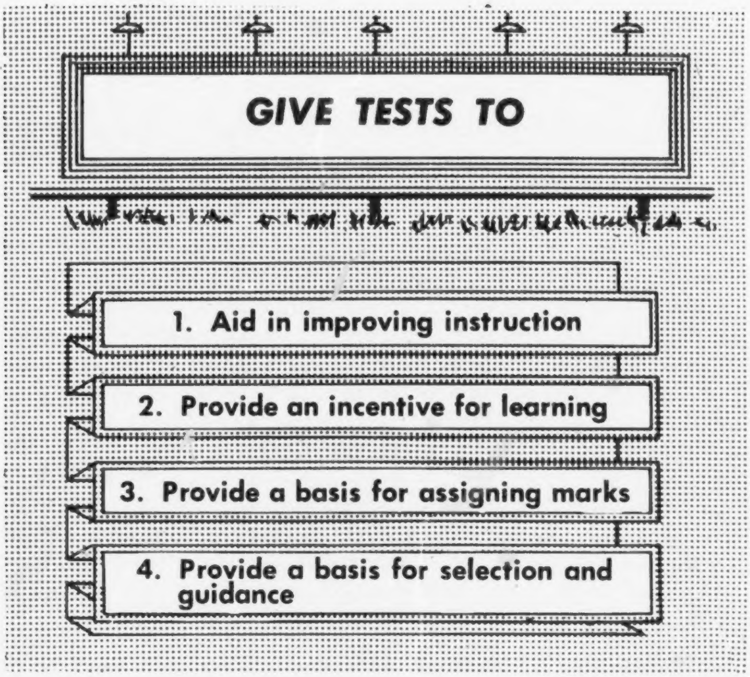

GIVE TESTS TO
1. Aid in improving instruction
2. Provide an incentive for learning
3. Provide a basis for assigning marks
4. Provide a basis for selection and guidance

Figure 68. Reasons for tests.

Tests Provide an Incentive for Learning. Students learn more rapidly when made to feel responsible for learning. For example, they are more likely to pay close attention to a training film if they know a test will be given when the picture is over. Generally, instructors who give frequent tests will find that their students will be more alert and learn more. There is a danger, however, in overemphasizing tests and test results as the basic motivation for learning. Student interest in test scores is a superficial one that can lead to efforts to study the test rather than to learn the subject matter for its value in the future. Students who study primarily to pass tests forget what they learn much faster than do those who are interested in learning because of the real values to be derived. The instructor should give rigid tests and give them frequently, but they should be designed to require the student to make application of what he has been taught.

Tests Provide a Basis for Assigning Grades. Another purpose of testing is to determine which students have attained the minimum standard of performance and which have not. In many cases it is desirable to indicate the extent to which students exceed or fall below the standards required. Students learn different amounts; the grade recorded for each student should be an accurate index of what he has learned. Unless a sound testing program is employed, it is impossible to determine the relative achievement of students.

Tests Furnish a Basis for Selection and Guidance. Instructors should be familiar with those Army tests that are especially designed to help in the classification of men and their subsequent selection for various Army assignments, including area aptitude batteries and MOS proficiency tests. The results of training achievement tests furnish valuable supplementary information for selection and guidance of personnel. If a test is well-constructed and accurately measures student performance, the test results become a valuable basis for determining whether a student should be placed in a new job, receive advance training, or be recommended for promotion to a job requiring greater ability.

FORMS OF TESTS

Formal evaluation can be classified in three major categories: written tests, performance tests, and observation ratings. Each form has its specific uses, advantages, and limitations. For a well-rounded test program, all techniques should be used.

Written Tests. Written tests are of great value in measuring information. Short-answer written tests have the added value of affording a rapid measurement of student knowledge over a large area of subject matter. Written tests can only indirectly measure a student's ability to apply knowledge and skills. In most Army training programs, performance tests should be relied on to determine whether a student can actually perform a skill or technique.

Performance Tests. A performance test measures how well students can do or perform a given piece of work. They are required to make, service, repair, operate, shape, assemble, or disassemble something, and are checked on their speed and accuracy. Performance tests measure skill, information, ability to apply knowledge, ability to solve problems, and aptitude for training. The advantages of performance tests are—

a. A performance test is the most direct means of finding out whether men can actually do a job and do it well. A student who can easily pass a written test on how to reline brakes many commit several errors while actually carrying out the task.

b. Performance tests reveal, better than any other type of test, specific difficulties that students encounter when doing a job. In a situation where students are required to service, repair, shape, assemble, or disassemble something, a performance test is the only effective way of revealing whether students—

(1) Handle their tools effectively.

(2) Observe all necessary safety precautions.

(3) Carry out the operations in the correct order or sequence.

(4) Become emotionally upset when unable to do any part of the job.

(5) Fail to care for their tools properly when they have finished their work.

Observation. If the problem is to evaluate students on leadership, observers must see the students in situations that permit them to demonstrate their leadership ability, such as giving commands, directing activities of a small unit, and making and executing decisions. Similarly, to judge a student's ability as an instructor, he must be observed as he handles classes under varying conditions. Observation and observation techniques are of great importance in Army training because many phases of student achievement and behavior cannot be measured by the more formal kinds of tests.

The US Army is now testing the Education Excellence (EDEX) System of Instruction. Use of this system is indicative of future trends in education. The EDEX System makes use of an instructor console and individual response units for each student participating in a particular class. Classroom instruction can be wholly programed into EDEX or only portions may be programed into the system. At various places throughout the instruction, multiple-choice questions are programed into the system and, through the student response units at each student desk, the instructor monitors on his console the immediate answers from his students. The instructor console has five meters which show him immediately just what percentage of the class selected each of the alternate choices to the question. From this immediate feedback, the instructor can adjust his instruction to reemphasize weak areas, place additional emphasis on areas of a more technical nature, or any other alterations he feels may be necessary to more effectively teach the subject matter.

ADMINISTERING TESTS

Need for Careful Administration. The results of tests that are improperly administered, or poorly constructed, give instructors an incorrect impression of the degree of student learning. Students must be given every opportunity to do their best on an examination. If a man gets a low score because he misunderstood instructions or was fatigued or emotionally upset, his score is not a true indication of his ability. Likewise, a high score resulting from cheating or from improper help by the instructor will be a false indication of a student's learning.

Procedures for Administering Tests.

a. Have All Testing Materials Ready. Make sure that enough test blanks, directions, checklists, operation sheets, tools, pencils, scratch paper, or other materials required are on hand in the classroom or test area before the test is scheduled to start.

b. Train the Assistants Needed. Make provisions for assistants to handle the mechanical aspects of the test, such as passing out materials. The instructor controls the overall situation. The number of assistants needed will depend upon the time required for administering the test and the number of individuals being tested.

(1) The smoothness of the testing procedure will be affected by the efficiency of the assistants. Instructors should make a work schedule for assistants to follow in distributing and collecting test materials, seating and dismissing the students, checking student work, supervising the conduct of the test, and giving students any help that is proper.

(2) The instructor should go over the examination carefully with the assistants and indicate to them the points at which they may expect students to have difficulty, the amount and kind of help they may give students, and their exact function and location in the classroom.

c. Provide the Best Possible Testing Conditions. Students cannot do their best in a dark, noisy, or crowded classroom. Eliminate all interest-destroying factors (unless such conditions are part of the test situation, as in the case of a test given to determine proficiency under battle conditions and administered with a noisy and distracting background). Place seats (or working layouts) so that each man will have ample working space and will not be in a position to inadvertently see anyone else's work. Men should be mentally and physically rested before they are given any crucial examination. No one in a state of fatigue, such as might be induced by extensive training on the previous night, can do justice to an examination (unless the test is purposely given at such a time to test knowledge or reactions under adverse conditions).

d. Give Students a Good Start. A test, like any other phase of instruction, should be started in a businesslike manner. The instructor should put the men at their ease and encourage them to do their best.

(1) The instructor must make certain that the test directions are understood. Write out the instructions for taking the test; read these directions to the students, clearly and unhurriedly. Encourage students to ask questions at the end of the reading in order to clear up any possible misunderstandings.

(2) Before starting the test, tell students the kind of help they can secure and the materials that are to be used. Tell them whether there is a time limit; if there is, explain whether it applies only to the overall test or to separate items or sections. If there is to be a bonus for speed or accuracy, explain it.

e. Conduct the Test Carefully. In order for a test to best reflect the ability of each man in the class, the conditions under which it is conducted should affect each man alike.

(1) Maintain order. Do not allow any student to interrupt another student or create any disturbance.

(2) If the test is timed, be sure that it is timed accurately. Tell the men in advance what time they must cease work, and have a clock plainly visible to all students.

CONDUCTING THE CRITIQUE OF TESTS AND PRACTICAL EXERCISES

General. An examination or practical exercise that cannot be interrupted for immediate on-the-spot correction of errors should always be followed by a critique to inform the student what was done right and what was done wrong. Good instruction includes intelligent, tactful, and constructive criticism; this criticism can be given most effectively in a group discussion held after an exercise or problem. The critique can be used to—

a. Sum up and clarify a situation developed in the lesson and point out correct or incorrect methods of execution.

b. Provide an overall view of the entire applicatory operation or maneuver.

c. Indicate the strong and the weak points of a performance and methods or procedures to be used in correcting errors or mistakes.

d. Re-emphasize the fundamental points of the lesson.

e. Develop among students a spirit of unity and an appreciation of the cooperation and teamwork necessary in military activities.

General Considerations.

a. Human Relations Are Important. In conducting a critique, the instructor must not be sarcastic; he must make criticisms or comments in a straightforward, impersonal manner. He should criticize individuals in private, and may praise them in public. Students should leave the critique with a favorable attitude toward the training activity and a desire to improve.

b. The Critique Should Relate the Instruction to the Subject or Course. It should emphasize the continuous nature of training by calling attention to what has been done earlier, and to the relation of the instruction just completed to the subject or course of which it is a part.

c. Specific Points Should Be Covered. Procedures used, examples of personal initiative or ingenuity, types of errors and ways of correcting them, and fundamental teaching points should be covered specifically.

d. Fundamentals Should Be Emphasized. Critiques that follow applicatory exercises, particularly tactical problems, should indicate various acceptable solutions. The impression should not be given that

154

there is but one correct method of solving the problem. Such misconceptions lead to the adoption of stereotyped solutions and to attempts to guess the approved solution, resulting in loss of initiative and independent thought. The critique should emphasize the fundamental principles of tactics in a situation, and should criticize and evaluate the different student solutions on the basis of their completeness, effectiveness, and observance of these fundamental principles.

e. Student Participation Should Be Encouraged. In almost every class there will be individuals who can relate experiences that will emphasize and illustrate key points. Too, a well-controlled class discussion makes students feel that the critique is a period for learning rather than a time set aside for criticism of their performance.

Steps in the Conduct of the Critique. The critique cannot be planned as thoroughly as other instruction because the points to be covered are influenced directly by the performance of the students. Advance planning can include the time, place, and general outline. During practical exercises the instructor can take notes to guide his critique, but detailed planning is not practical. However, the instructor can insure complete coverage of the essential elements by following this general procedure—

Step 1: Restate the Objective. This will enable the class to start its consideration of the period of instruction on a common ground. This step is necessary because some students may have become concerned only with a particular aspect of the subject and may have forgotten the overall objective.

Step 2: Review Procedures Employed. In this step briefly summarize the methods used in the exercise, or the teaching points brought out, to attain the objective. After a practical exercise, description of the activities of various participants and how each contributed to the common goal will answer the student questions: "What was this all about?" "What did we do?" and "What part did I play in the big picture?"

Step 3: Evalute Performance. This is the most important part of the critique of a practical exercise. Using notes taken during the exercise, the instructor points out and discusses the strong points of the exercise. Then he brings out weaker points and makes specific suggestions for improvement. He must be careful not to "talk down" to the group and must not expect a standard of performance beyond the capabilities of the students. All remarks must be specific; students do not benefit from generalities.

Step 4: Control the Group in Discussion. The instructor should encourage the class to discuss the points he has mentioned and to suggest other points for discussion. All the techniques of conducting a directed discussion apply in this step to insure that criticism is constructive and that discussion is to the point.

Step 5: Summarize. The critique should be concluded with a brief but comprehensive summation of the points brought out. The instructor can re-emphasize objectives and suggest study and practice to overcome deficiencies. The critique should be businesslike; it must not become argumentative.

CHAPTER 18

TRAINING LITERATURE

GENERAL

Reference and study texts are published and furnished to military personnel by the Department of the Army. These texts contain the official doctrine on tactics and techniques of the several branches and services of the Army and furnish source material for instruction in most military subjects.

DA pamphlets in the 310-series provide an index of all current training literature; the instructor should be thoroughly familiar with their use. Of the many types of publications listed in this series, there are three that the military instructor will use most frequently: Field Manuals (FM's), Technical Manuals (TM's), and Training Circulars (TC's).

TYPES OF PUBLICATIONS

Field Manual. Field manuals fall into two general categories: those that deal with the tactics and techniques of a branch or service, and those that contain information on the care, operation, nomenclature, functioning, and marksmanship of various weapons. These manuals might well be termed the basic reference library for the instructor. They may also be used as study texts for advanced students. Other training literature, on pertinent subjects, is based on this library.

Technical Manual. Technical manuals, as their name implies, deal in general with technical aspects of subjects. Every piece of equipment in the Army should, when originally issued, be accompanied by an operator's instruction book, which is one type of TM. The technical manual in the Army corresponds to the book of instructions that a civilian expects to find in the glove compartment of a new car, except that the Army manual is in much greater detail, to provide the information necessary for thorough maintenance, care, and operation of the equipment. In addition, technical manuals may describe how to perform a highly skilled task or series of tasks such as operating the Army postal system, or may be school textbooks like *Army Arithmetic.*

Training Circular. When new training doctrines, techniques, or tactics are decided upon and are of such importance that immediate dissemination is essential, training circulars are published and distributed. In general, they are limited in scope and in length of time in force. A training circular will be superseded by a field or technical manual at the earliest opportunity.

Army Regulations. Army regulations (AR) are a source of material for instructors in such subjects as wearing of the uniform and administration, Training directives, issued by various levels of command, frequently contain pertinent training material for the instructor.

USE OF TRAINING LITERATURE

For the instructor, the official training literature of the Army is a reference library; for advanced students, items of training literature are study texts. Army training programs, unit training schedules, and subject schedules generally list references for each subject to be taught. In preparing a lesson for a particular subject, the instructor selects his source material from the reference library and arranges the essential facts for presentation in a logical and progressive order.

Reading or reciting from manuals cannot be tolerated. The instructor must present source material in his own words.

If manuals must be supplemented by other material, care should be taken to use only recognized supplementary data. Narratives of personal experiences are encouraged when they are on the subject and agree with established doctrine.

158

PART THREE

WEAPONS: INDIVIDUAL, CREW-SERVED, AND ANTIPERSONNEL/TANK MINES

CHAPTER 19

INDIVIDUAL WEAPONS

HAND GRENADES

GENERAL

When the infantryman meets the enemy in combat a weapon is needed to drive the enemy from his bunker or position. The hand grenade is just such a weapon. Hand grenades have been used since the earliest days of organized warfare; but hand grenades, as we know them today, are a recent development. They are used as needed in all units.

All present standard hand grenades share two common characteristics—short range and small effective casualty radius. Hand grenades are used for casualty producing, screening, signaling, incendiary effect, and riot control (fig. 69).

NEW DEVELOPMENTS

In order to alleviate problems stemming from the time delay element of the fragmentation hand grenade fuze, impact detonating counterparts have been designed.

The M217 fuze gives the M26 and M33 series of grenades the impact capability (fig. 69). One second after the primer has been struck, the grenade is armed and will detonate upon impact. As a back-up system, the fuze also incorporates a standard time delay feature (4 to 5 seconds) which will function if the impact element does not.

COMPONENTS

Body. The body is nominally constructed from any material capable of holding the filler. It gives the grenade its shape.

NOMENCLATURE	BODY	FILLER	FUZE	WEIGHT	THROWING DISTANCE
MK 1 ILLUMINATING	SHEET STEEL	3.5 OZ. ILLUMINATING PYROTECHNIC COMPOSITION.	DELAY IGNITING.	10 OZ	40 M.
MK 2 FRAGMENTATION	CAST IRON (SERRATED).	2 OZ. FLAKED TNT	M6A4C, M204A1, M204A2	21 OZ	30 M.
MK3A2 OFFENSIVE	FIBER	8 OZ. FLAKED TNT	M206A2	15.6 OZ.	40 M.
M6 RIOT CONTROL	SHEET STEEL	10.5 OZ. CN-DM	M201A1	17 OZ	35 M.
M6A1 RIOT CONTROL	SHEET STEEL	9.5 OZ. CN-DM	M201A1	20 OZ	35 M.
M7 RIOT CONTROL	do	10.25 OZ. CN	M201A1	17 OZ	35 M.
M7A1 RIOT CONTROL	do	12.5 OZ. CN	do	18.5 OZ	35 M.
ABC-M7A2 RIOT CONTROL.	do	5.5 OZ. BURINING MIXTURE, 3.5 OZ. POWDERED CS.	do	15.5 OZ	40 M.
AVC-M7A3 RIOT CONTROL.	do	7.5 OZ.BURNING MIXTURE, 4.5 OZ. PELLETIZED CS.	do	do	Do.

NOMENCLATURES	BODY	FILLER	FUZE	WEIGHT	THROWING DISTANCE
AN–M8 WHITE SMOKE	SHEET STEEL	19 OZ. HC (HEXACHLOROTHANE).	M201AZ	24 OZ	30 M.
AN–M14 TH3 INCENDIARY.	do	26.5 OZ. THERMATE (TH3).	do	32 OZ	25 M.
M18 COLORED SMOKE	do	11.5 OZ. COLORED SMOKE MIXTURE.	do	19. OZ	35 M.
ABC–M25A1, ABC–M25A2, RIOT CONTROL.	COMPRESSED FIBER OR PLASTIC.	APPROXIMATELY 4 OZ. CN. OR DM, OR CS.	INTEGRAL C–12.	7.5–8 OZ	50 M.
M26, M26A1, FRAGMENTATION.	SHEET STEEL WITH SERRATED WIRE COIL.	5.5 OZ. COMPOSITION B	M204A1 OR M204A2, (M26); M204A2, (M26A1).	16 OZ	40 M.
M56	do	5.5 OZ. COMPOSITION B	M215	16 OZ	Do.
M 57 (FORMERLY M 26A2).	do	do	M217	do	Do.

M33	STEEL OBLATE SPHERIOD.	6.5 OZ. COMPOSITION B.	M213	13.9 OZ.	42 M.
M59	do	do	M217	do	Do.
M30 PRACTICE	CAST IRON		M10A2, M10A3, M205A1 OR M205A2	16 OZ.	40 M.
M34 WP SMOKE	ROLLED STEEL (SERRATED).	15 OZ. WP	M206A2	27 OZ.	30 M.
M69 PRACTICE	CAST IRON		XM224	14 OZ.	50 M.

Figure 69. Summary of grenades and ground pyrotechnic signals.

DELAY TIME	COLOR AND MARKINGS (NEW) (CHECK TEXT FOR OLD)	PRIMARY USES	EFFECTS
7 SEC	UNPAINTED WITH BLACK MARKINGS.	SIGNALING, ILLUMINATING.	25 SEC. BURNING TIME, 55,000 CANDLEPOWER, ILLUMINATES AREA 200 M. IN DIAMETER.
4–5 SEC	OD WITH YELLOW BAND.	CASUALTY-PRODUCING.	10 M. EFFECTIVE CASUALTY RADIUS.
4–5 SEC	BLACK WITH YELLOW MARKINGS.	CONCUSSION (DEMOLITION, CASUALTY, BLAST).	2 M. EFFECTIVE CASUALTY RADIUS IN OPEN AREAS.
1.2–2 SEC	GRAY WITH RED BAND AND MARKINGS.	RIOT CONTROL.	20–60 SEC. BURNING TIME.
1.2–2 SEC	do	do	Do.
Do	do	do	Do.
Do	do	do	Do.
Do	do	do	Do.
Do	do	do	Do.
Do	LIGHT GREEN WITH BLACK MARKINGS AND WHITE TOP.	SIGNALING AND SCREENING.	105–150 SEC. BURNING TIME.
Do	LIGHT RED WITH BLACK MARKINGS.	INCENDIARY	BURNS 40 SEC. AT 4000° F. WILL BURN THROUGH ¼-INCH HOMOGENEOUS STEEL PLATE.

DELAY TIME	COLOR AND MARKINGS (NEW) (CHECK TEXT FOR OLD)	PRIMARY USES	EFFECTS
1.2–2 SEC	LIGHT GREEN WITH BLACK MARKINGS AND TOP OF SAME COLOR AS SMOKE PRODUCED.	SIGNALING AND SCREENING.	BURNING TIME 50–90 SEC.
1.4–3 SEC	GRAY WITH RED BAND AND MARKINGS.	RIOT CONTROL.	5 M. BURSTING RADIUS, FRAGMENTS OCCASIONALLY TRAVEL AS FAR AS 25 M. (PLASTIC GRENADE FRAGMENTS HAVE 25 M. BURSTING RADIUS).
4–5 SEC	OD WITH YELLOW BAND AND MARKINGS.	CASUALTY-PRODUCING.	15 M. EFFECTIVE CASUALTY RADIUS.
4–5 SEC		do	Do.
1 SEC. AND THEN IMPACT, OR AUTOMATICALLY 4 SEC. AFTER SAFETY LEVER HAS BEEN RELEASED.	OD WITH YELLOW BAND AND MARKINGS. "IMPACT" EMBOSSED ON RED SAFETY LEVER.	do	Do.
4–5 SEC	OD WITH YELLOW BAND AND MARKINGS.	do	Do.

DELAY TIME	COLOR AND MARKINGS (NEW) (CHECK TEXT FOR OLD)	PRIMARY USES	EFFECTS
1 SEC. AND THEN IMPACT, OR AUTOMATICALLY 4 SEC. AFTER SAFETY LEVER HAS BEEN RELEASED.	OD WITH YELLOW BAND AND MARKINGS. "IMPACT" EMBOSSED ON RED SAFETY LEVER.	CASUALTY PRODUCING.	15 M. EFFECTIVE CASUALTY RADIUS
4-5 SEC.	LIGHT BLUE WITH WHITE MARKINGS.	PRACTICE (TRAINING).	LOUD POPPING NOISE AND CLOUD OF WHITE SMOKE.
4-5 SEC.	LIGHT GREEN WITH YELLOW BAND AND RED MARKINGS.	CASUALTY-PRODUCING, SIGNALING, SCREENING, INCENDIARY.	35 M. BURSTING RADIUS, BURNS FOR 60 SEC.
4-5 SEC.	LIGHT BLUE WITH WHITE MARKINGS.	PRACTICE (TRAINING).	LOUD POPPING NOISE AND CLOUD OF WHITE SMOKE.

Filler. The filler is the explosive or chemical contained within the body. It gives the grenade its characteristics and determines its mission.

Fuze Assembly. The fuze assembly is the heart of the grenade. The fuze is a device which, through a chemical and mechanical or electrical action, causes the grenade to function. The fuze assembly consists of the safety lever, safety pin and safety pin pull ring, fuze body, striker, striker arm and spring, primer, delay element, and the detonator or igniter.

a. A detonator is used with high explosive fillers and bursting-type chemical grenades.

b. An igniter is used with burning-type chemical grenades and with practice grenades.

c. Ordnance hand grenades and bursting-type chemical grenades have an average time delay element of 2 to 5 seconds. All burning-type chemical grenades have an average time delay element of 2 seconds.

TRAINING TIPS

The criteria for hand grenade training is *distance* and *accuracy.* Seventy-five percent of grenade training must be devoted to throwing *practice.*

The method used to throw the hand grenade is relatively unimportant; however, follow through is important. The position used is also unimportant. The situation and terrain will dictate the position used.

The method of gripping the grenade is very important. There is only one way to grip the hand grenade correctly. The body of the grenade is held firmly by the fingers and the safety lever is held down securely by the thumb between the *first* and *second* joints. The soldier can use hand grenades against a wide variety of targets and in many situations—enemy pillboxes, armored vehicles, gun positions, and many other targets. They are particularly useful at night since the soldier can throw them without disclosing his position. The soldier can rely upon the hand grenade as his "pocket artillery."

THE 66-MM HEAT ROCKET, M72A2

GENERAL

The 66-mm High Explosive Antitank Rocket M72A2 has been designed to replace the 3.5-inch rocket launcher in all of its noncrew-served positions. It is a smooth bore, percussion fired, shoulder weapon that features simplicity, light weight, and compactness. The M72A2 is issued to the individual in addition to his TOE weapon. It is issued to the unit in a basic load. The M72A2 is a self-contained unit consisting of a rocket (fig. 73) and an expendable launcher. The rocket is posi-

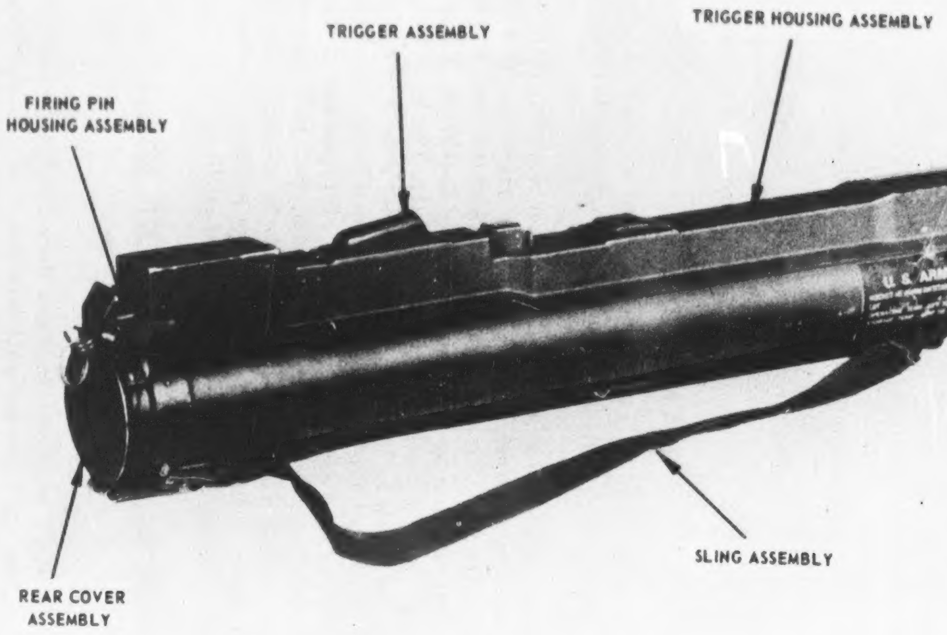

TRIGGER ASSEMBLY
TRIGGER HOUSING ASSEMBLY
FIRING PIN HOUSING ASSEMBLY
SLING ASSEMBLY
REAR COVER ASSEMBLY

Figure 70. Rocket launcher, closed position.

tioned in the launcher at the time of manufacture. In its closed position (fig. 70) the launcher serves as a water resistant packing container for the rocket, and it is extended (fig. 71) telescopically to launch and guide the rocket on its initial flight. The M72A2 is capable of disabling the heaviest known armor.

SPECIFICATIONS

Total weight	5.2 pounds.
Launcher weight	3.0 pounds.
Rocket weight	2.2 pounds.
Launcher length	26 inches closed), 35 inches (extended).
Rocket length	20 inches.
Firing mechanism	Percussion.
Sights:	
Rear: peepsight adjusts automatically to temperature change (fig. 72).	
Front: reticle graduated from 50 to 350 meters in 25-meter increments.	
Muzzle velocity	475 feet per second at 70° F.
Maximum range	1,000 meters.
Maximum effective range	200 meters (based on an average for both moving and stationary targets).

DETAILED DESCRIPTION

The launcher for the 66-mm rocket is constructed of fiber glass and aluminum, and is composed of two concentric tubes. The inner tube is oriented with respect to the outer tube by a channel assembly, which rides in an alinement slot in the trigger housing assembly. The outer tube has the following parts affixed to it: the trigger housing assembly located on the upper surface of the outer tube, trigger assembly, trigger safety handle, rear sight assembly, front sight assembly, and rear cover. The inner tube is constructed of aluminum: it will extend telescopically along the channel assembly which houses the firing pin rod assembly and locks the launcher in the extended position through the detent lever assembly. The firing pin rod assembly locks under the trigger assembly and cocks the weapon upon extension. The launcher is boresighted at time of manufacture. The 66-mm HEAT rocket is 20 inches (fig. 73) in length and is composed of three parts: the rocket motor, the fuze assembly, and the warhead. The fuze is of the point initiating, base detonating type. It incorporates an electric crystal and a mechanical firing pin and primer for graze functioning. The warhead utilizes a shaped charge to achieve armor penetration.

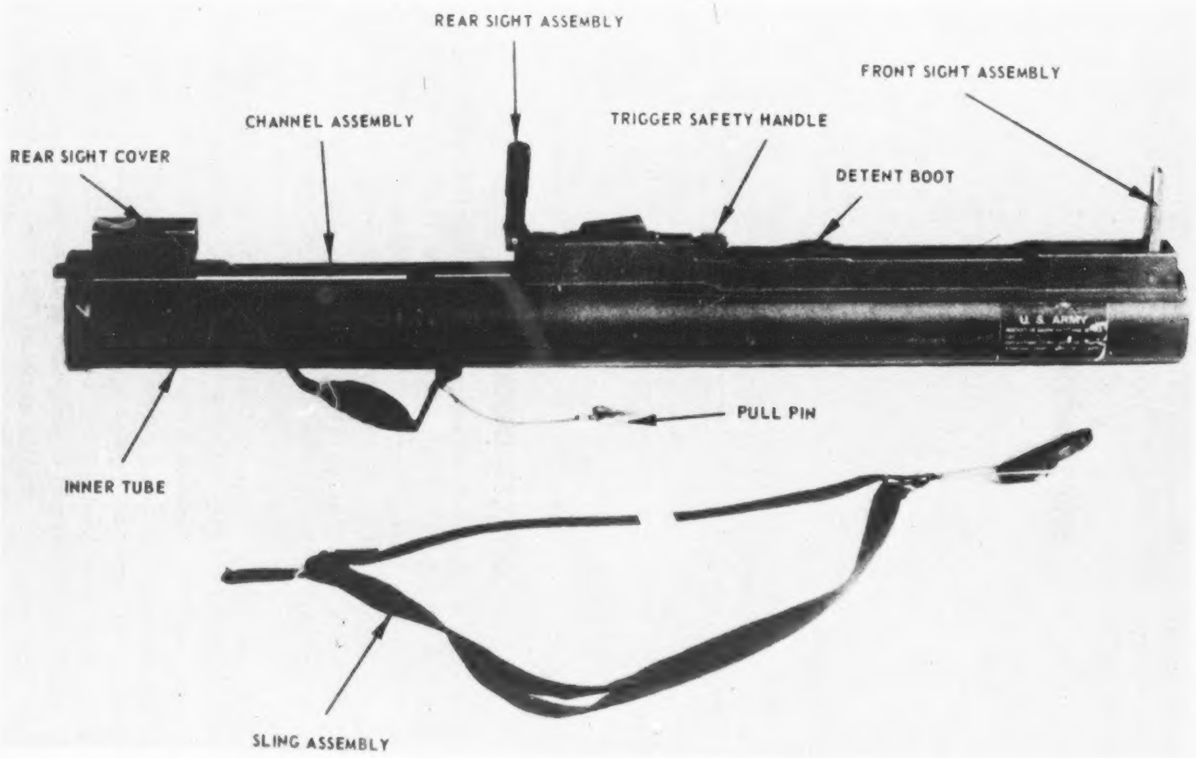
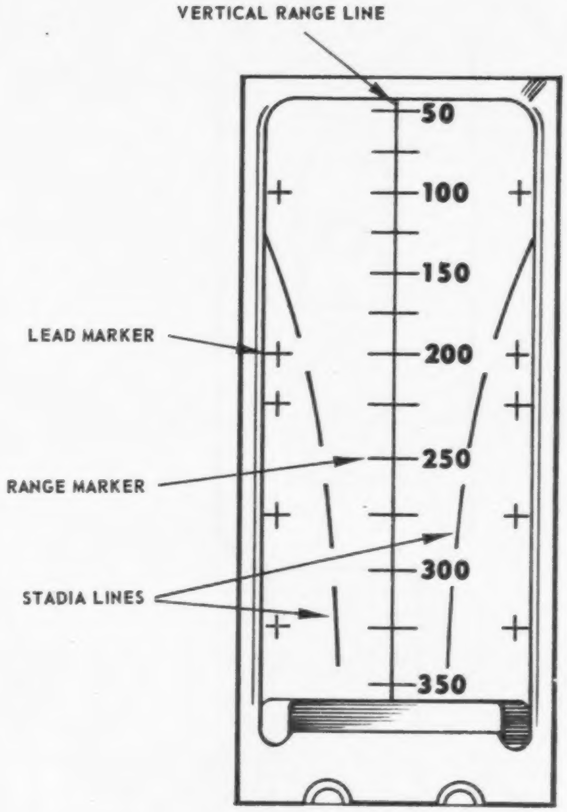

REAR SIGHT ASSEMBLY
FRONT SIGHT ASSEMBLY
CHANNEL ASSEMBLY
TRIGGER SAFETY HANDLE
REAR SIGHT COVER
DETENT BOOT
U. S. ARMY
PULL PIN
INNER TUBE
SLING ASSEMBLY

Figure 71. Rocket launcher, open position.

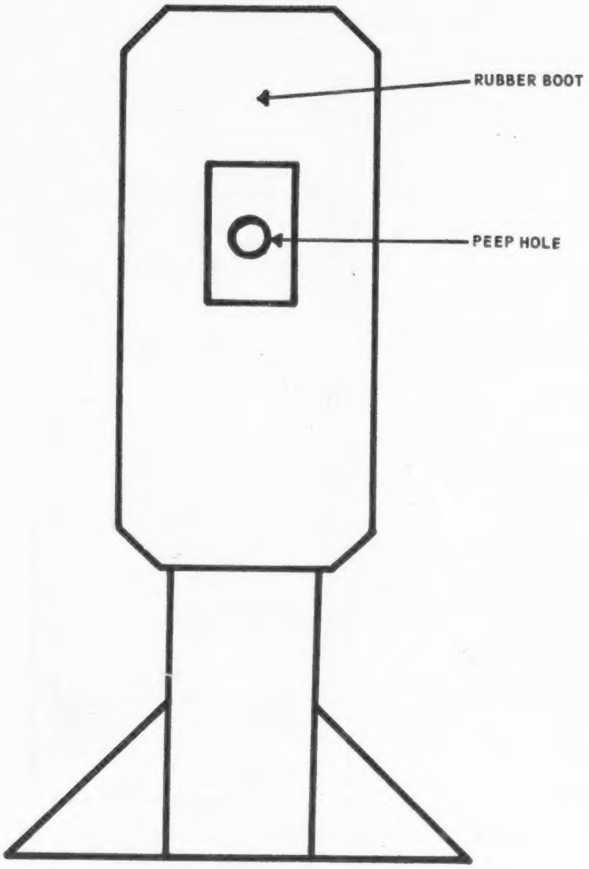


1 Front

Figure 72. Launcher sights.

FUNCTIONING

When the trigger on the M72A2 is depressed it releases the tension on the firing pin spring and the firing pin rod, allowing the firing pin rod to drive rearward into the primer. The primer detonates, igniting the black powder contained in the flash tube, which in turn burns down into the nozzle of the rocket where it activates the igniter for the rocket propellant. The burning propellant drives the rocket forward out of the launcher with a velocity of approximately 475 feet per second. All of the propellant is burned before the rocket leaves the launcher (fig. 74). As the rocket leaves the muzzle, the spring loaded fins snap into position to stabilize the rocket in flight. When the rocket strikes the target, the electric crystal in the nose is crushed, emitting a low voltage impulse which is conducted to the electric detonator in the fuze, ex-



2 Rear

Figure 72—Continued

ploding the warhead. Should the crystal not be crushed, the fuze will be activated by the deceleration of the rocket.

GUNNERY

The firing instructions for the M72A2 are stenciled in illustrated form on the side of each launcher (fig. 75). To place the M72A2 into operation, the gunner will proceed as follows:

Remove the rear cover retaining pin.

Rotate to the rear and downward on the rear cover.

Release the sling assembly.

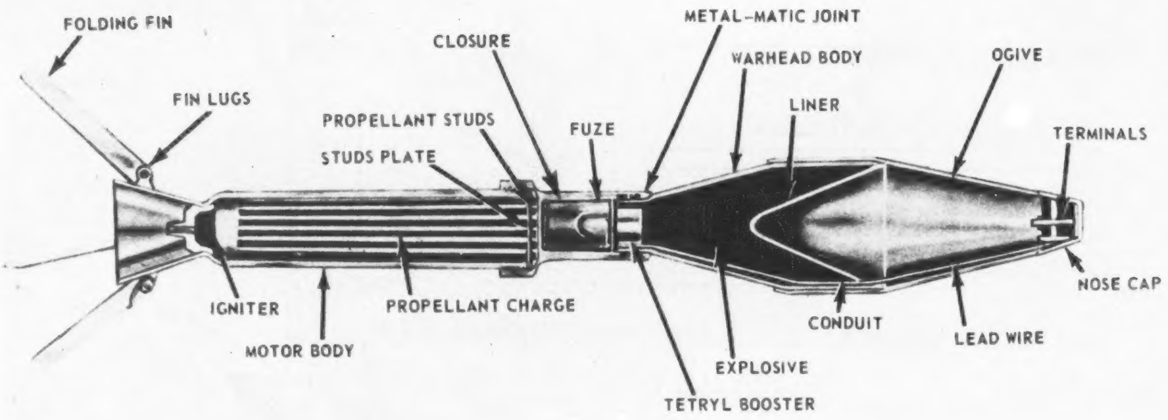

FOLDING FIN
FIN LUGS
CLOSURE
PROPELLANT STUDS
STUDS PLATE
FUZE
METAL–MATIC JOINT
WARHEAD BODY
LINER
OGIVE
TERMINALS
NOSE CAP
IGNITER
MOTOR BODY
PROPELLANT CHARGE
CONDUIT
LEAD WIRE
EXPLOSIVE
TETRYL BOOSTER

Figure 73. The 66-mm high explosive antitank (HEAT) rocket.

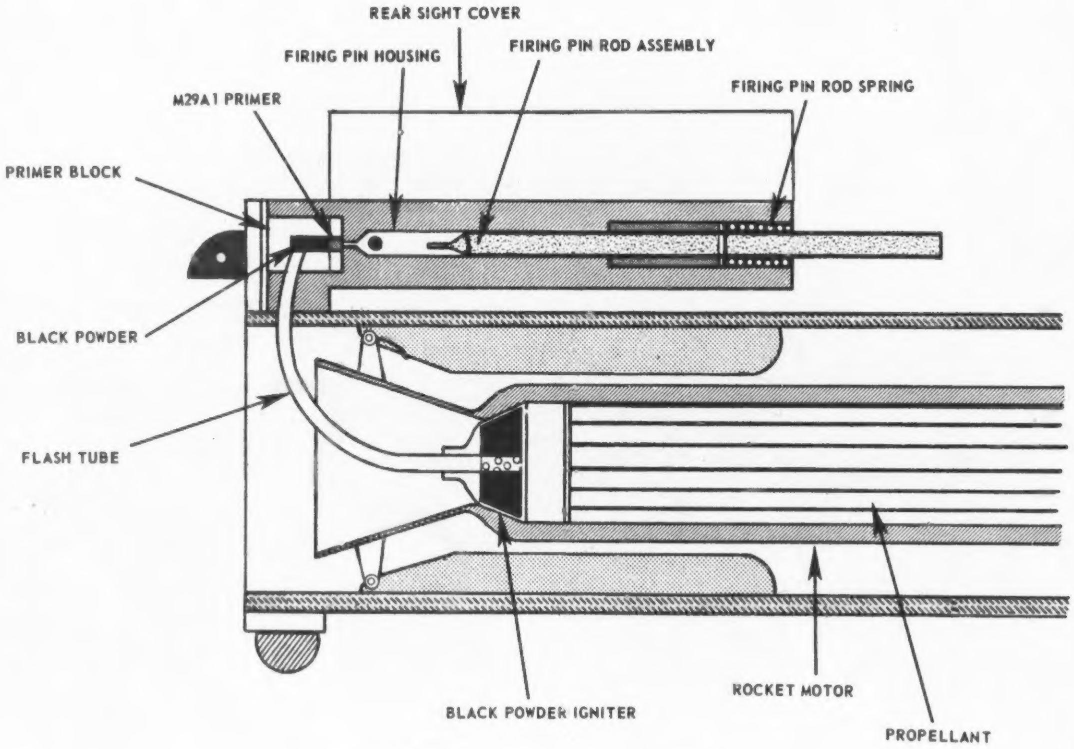

REAR SIGHT COVER
FIRING PIN HOUSING
FIRING PIN ROD ASSEMBLY
FIRING PIN ROD SPRING
M29A1 PRIMER
PRIMER BLOCK
BLACK POWDER
FLASH TUBE
BLACK POWDER IGNITER
ROCKET MOTOR
PROPELLANT

Figure 74. Rocket motor ignition system.

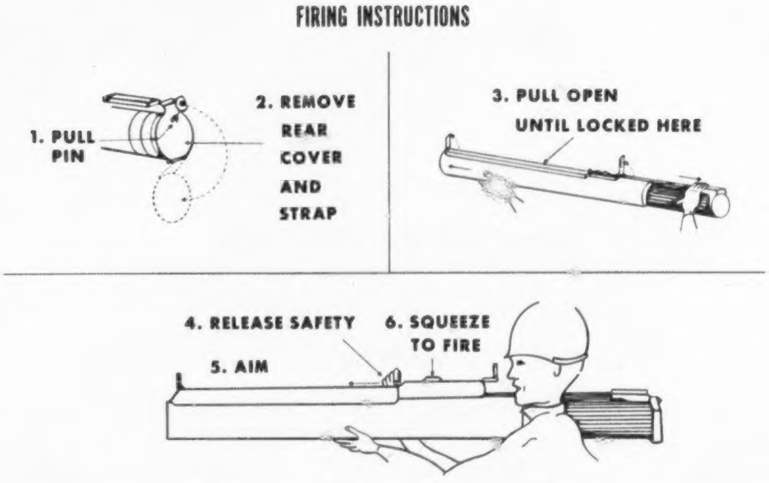

FIRING INSTRUCTIONS
1. PULL PIN
2. REMOVE REAR COVER AND STRAP
3. PULL OPEN UNTIL LOCKED HERE
4. RELEASE SAFETY
5. AIM
6. SQUEEZE TO FIRE

Figure 75. Rocket firing instructions.

Grasp the rear sight cover and sharply pull the launcher to the rear until it locks into position.

Check the backblast area.

Place the launcher on the shoulder.

Pull out on the trigger safety.

Sight on target.

Squeeze the trigger bar.

Once fired, the tube is discarded. In the event the weapon is prepared for firing but not fired, it can be easily uncocked and returned to the carrying position, however, the unit is no longer water-resistant. The gunner would proceed as follows:

Reengage trigger safety.

Press in on detent.

Collapse the launcher and replace the sling assembly.

CHAPTER 20

CREW-SERVED WEAPONS

MACHINEGUN, 7.62-MM, M60

GENERAL

The machinegun is designed to support the rifleman in both offensive and defensive operations with a heavy volume of controlled, accurate fire that is far beyond the capability of individual weapons. Machineguns provide the rifleman with the close continuous supporting fire necessary to accomplish his mission in the attack, while their long-range, close defensive, and final protective fires comprise the framework around which the defensive posture of the small unit is built.

DESCRIPTION

The M60 machinegun is an air-cooled, belt-fed, gas-operated automatic weapon and fires from the open-bolt position. Ammunition is fed into the gun by a disintegrating metallic split-link belt. The M60 features fixed headspace which permits rapid changing of barrels. Two barrels are issued with each weapon.

Tabulated Data.

Ammunition	7.62-mm (ball, tracer, armor piercing, blank, dummy.) (Armor piercing and armor piercing incendiary are not authorized for training.)
Length of gun	43½ inches.
Weight of gun	23 pounds.
Weight of tripod mount M122 with traversing and elevating mechanism and gun platform.	19½ pounds.
Maximum effective range	1,100 meters.
Maximum extent of grazing fire obtainable over level or uniformly sloping terrain.	600 meters.
Tracer burnout	900 meters (approximately).
Maximum range	3,725 meters.
Height of gun on tripod mount M122	16½ inches.

Tabulated Data—Continued

Rates of fire:	
Sustained	100 rounds per minute (change barrel every 10 minutes).
Rapid	200 rounds per minute (change barrel every 2 minutes).
Cyclic	Approximately 550 rounds per minute (change barrel every 1 minute).
Basic load of ammunition (on crew)	600 to 900 rounds.
Gunner carries three 100-round bandoleers (one attached to weapon).	
Assistant gunner carries three 100-round bandoleers.	
Ammunition bearer, when present, carries three 100-round bandoleers.	
Traverse, controlled by traversing and elevating mechanism.	100 mils.
Normal sector of fire	875 mils (with tripod).

Sights. The M60 has a front sight permanently affixed to the barrel. The rear sight leaf is mounted on a spring-type dovetail base (fig. 76). It is folded forward to the horizontal when the gun is being moved. The adjustable range plate on the rear sight leaf is marked for each 100 meters from 300 meters to the maximum effective range of 1,100 meters.

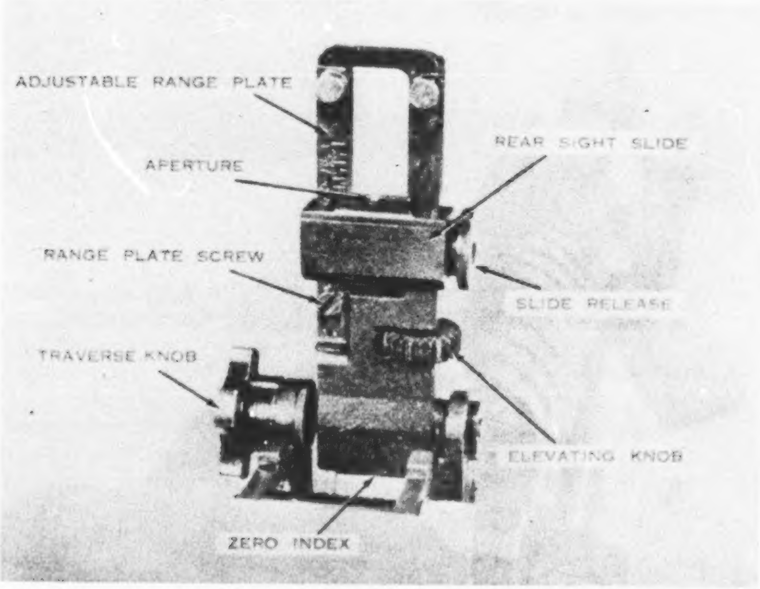

ADJUSTABLE RANGE PLATE
REAR SIGHT SLIDE
APERTURE
RANGE PLATE SCREW
SLIDE RELEASE
TRAVERSE KNOB
ELEVATING KNOB
ZERO INDEX

Figure 76. Rear sight.

MOUNTS

Bipod Mount. The bipod mount is an integral part of the barrel group. It is not removed at unit level. The bipod yoke fits around the barrel and is held in position by the flash suppressor (fig. 77).

Tripod Mount. The M122 tripod mount consists of the tripod assembly, the traversing and elevating mechanism, and the platform and pintle assembly.

a. The *tripod assembly* consists of the tripod head with the pintle lock, one front and two rear legs, and a traversing bar. The traversing bar connects the two rear legs and supports the traversing and elevating mechanism. Engraved on the bar is a scale which is divided into

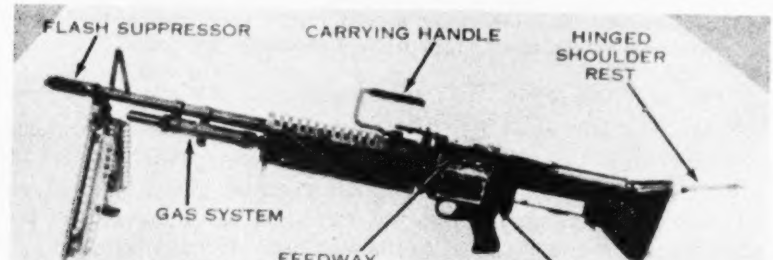

FLASH SUPPRESSOR
CARRYING HANDLE
HINGED SHOULDER REST
GAS SYSTEM
FEEDWAY
BIPOD LEG
SAFETY
COVER LATCH
REAR SIGHT
FRONT SIGHT
COVER
BARREL LOCK LEVER
COCKING HANDLE
GUN PLATFORM
PINTLE
ELEVATION ADAPTER
TRAVERSING AND ELEVATING MECHANISM

Figure 77. M60 machinegun bipod and tripod mounted.

100-mil divisions and 5-mil subdivisions, 450 mills to the left and 425 to 430 mils to the right of center. Sliding sleeves connect the traversing bar and the rear legs to permit folding the legs. Position stops are provided to stop the traversing bar in the open or closed position. The traversing bar sleeve latch on the right rear leg secures the traversing bar when in the open position (fig. 77).

b. The traversing and elevating mechanism (fig. 78) consists of the—

(1) Elevation adapter which connects to the mounting plate on the bottom of the receiver.

(2) Traversing handwheel which has a mil click device built into it. One click equals a 1-mil change. Engraved on the traversing handwheel is a scale which is divided in 1-mil increments with a total of 25 mils.

(3) Elevating handwheel, and the upper and lower elevating screw. The elevating handwheel has a mil-click device built into it. One click equals a 1-mil change. Engraved on the handwheel is a scale which is divided into 5-mil major divisions and 1-mil subdivisions. The upper elevating screw has an elevating screw plate which is graduated into 50-mil increments.

(4) Traversing slide and the traversing slide lock lever which allow rapid lateral adjustments along the traversing bar.

c. The *platform and pintle assembly* (fig. 78) consists of the gun platform, to which the gun is attached, and the pintle, which is secured to the tripod assembly.

FLASH SUPPRESSOR AND SAFETY

The flash suppressor consists of five metal ribs. The vibration of the metal ribs disperses the flash and smoke during firing.

The safety lever is located on the left side of the trigger housing group. If the lever is on the S (safe) position, the bolt cannot be released to go forward, nor can it be pulled to the rear. If the safety lever is on the F (fire) position, the bolt will go forward when the trigger is pulled; the bolt can also be pulled to the rear by pulling the cocking handle rearward. Each time that the bolt is manually pulled to the rear, the cocking handle must be returned to the forward position.

MACHINEGUN MARKSMANSHIP TRAINING

Machinegun marksmanship training includes training on both the basic (10-meter) and transition ranges. During this training a gunner is taught the fundamentals of machinegun marksmanship with the bipod and tripod mounted machinegun. This training is conducted in three phases—bipod instructional firing on the basic (10-meter) range, tripod instructional and record firing on the basic (10-meter) range,

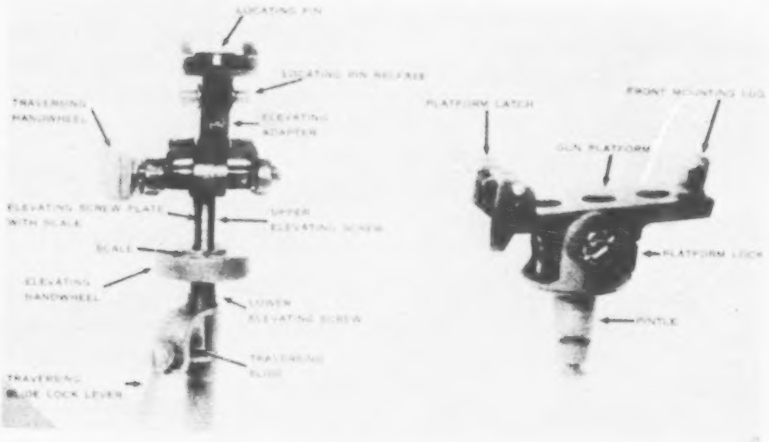

LOCATING PIN
LOCATING PIN RELEASE
TRAVERSING HANDWHEEL
ELEVATING ADAPTER
ELEVATING SCREW PLATE WITH SCALE
UPPER ELEVATING SCREW
SCALE
ELEVATING HANDWHEEL
LOWER ELEVATING SCREW
TRAVERSING SLIDE
TRAVERSING SLIDE LOCK LEVER
PLATFORM LATCH
FRONT MOUNTING LUG
GUN PLATFORM
PLATFORM LOCK
PINTLE

Figure 78. Traversing and elevating mechanisms, pintle and platform group.

and bipod instructional and record firing on the transition range. During basic marksmanship training the objectives and fundamentals of machinegun marksmanship are taught and applied during dry and live fire exercises. The objectives of machinegun marksmanship are to—

Obtain an accurate initial burst.
Traverse and search with the gun.
Observe and adjust fire.
Operate with speed.

CLASSES OF FIRE

Machinegun fire is classified with respect to the ground, target, and gun.

Fire With Respect to the Ground (fig. 79).

a. Grazing. When the center of the cone of fire does not rise more than 1 meter above the ground. When firing over level or uniformly sloping terrain, a maximum of 600 meters of grazing fire can be obtained.

b. Plunging. When the danger space is practically confined to the beaten zone. Plunging fire occurs when firing at long ranges, when firing from high ground to low ground, and when firing into abruptly rising ground.

Fire With Respect to the Target (fig. 80).

a. Frontal. When the long axis of the beaten zone is at a right angle to the front of the target.

b. Flanking. When delivered against the flank of a target.

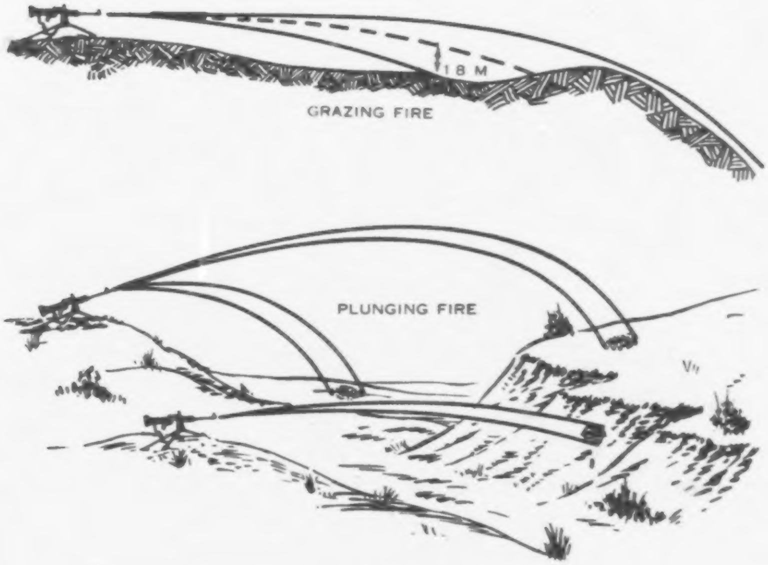


Figure 79. Plunging and grazing fire.

c. Oblique. When the long axis of the beaten zone is at an angle other than a right angle to the target.

d. Enfilade. When the long axis of the beaten zone coincides with the long axis of the target. This type of fire is either frontal or flanking and is the most desirable type of fire with respect to a target because it makes maximum use of the beaten zone.

Fire With Respect to the Gun (fig. 81). There are six types of fire with respect to the gun: fixed, traversing, searching, traversing and searching, swinging traverse, and free gun.

a. Fire with respect to the tripod mounted gun is—

(1) *Fixed* when delivered against point targets which require a single aiming point.

(2) *Traversing* when distributed in width by successive changes in direction of the gun. With the tripod mounted gun, the changes are made in 4- to 6-mil increments on the traversing handwheel. To insure adequate target coverage, a burst is fired after each direction change.

(3) *Searching* when distributed in depth by successive changes in elevation. When firing the tripod mounted gun, changes are made on the elevating handwheel in 2-mil increments when firing over level ground. If the terrain slopes up from the gun position, more than 2 mils of change is required. If the terrain slopes down, less than 2 mils is required.

(4) *Traversing and searching* when distributed in width and

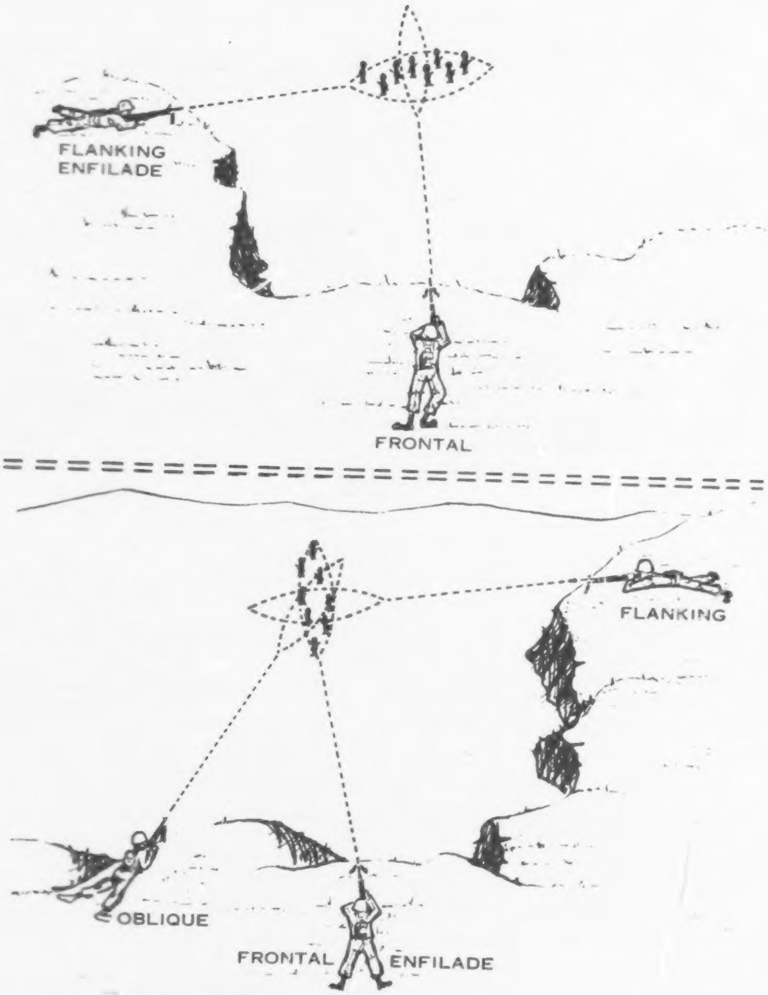

FLANKING
ENFILADE
FRONTAL
FLANKING
OBLIQUE
FRONTAL
ENFILADE

Figure 80. Classes of fire with respect to the target.

depth by successive changes in direction and elevation. With the tripod mounted gun, the changes in direction are made in 4- to 6-mil increments on the traversing handwheel. The amount of elevation change is determined by the slope of the terrain and the disposition of the target.

(5) *Swinging traverse* when delivered against targets too wide to cover with the traversing handwheel and targets moving so rapidly across the gunner's front that he cannot maintain effective fire while

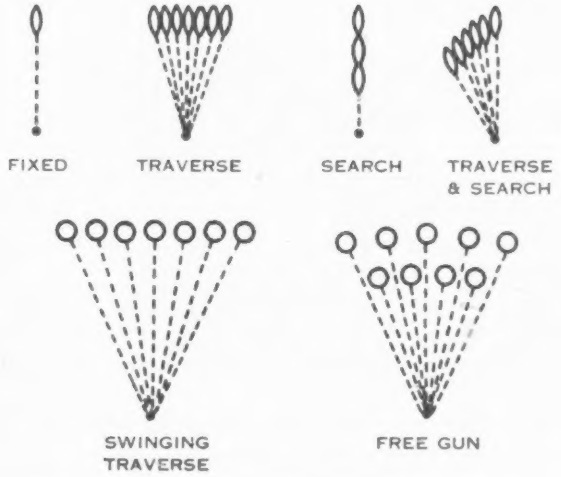


Figure 81. Classes of fire with respect to the gun.

using the traversing handwheel. To deliver this type of fire, the gunner loosens the traversing bar slide lock lever to allow the traversing and elevating mechanism to slide freely on the traversing bar.

(6) *Free gun* when delivered from the tripod mount against targets requiring rapid, major changes in direction and elevation which cannot be applied with the traversing and elevating mechanism, and when delivered from a pedestal mount against targets which cannot be adequately covered by selecting a series of aiming points. To deliver this type of fire from the tripod mount, the gunner loosens the traversing slide lock lever and lifts the traversing and elevating mechanism from the traversing bar to allow the gun to be moved freely in any direction.

b. With the bipod mounted gun, fixed fire is delivered by firing a series of bursts at a single aiming point. To deliver traversing, searching or traversing, and searching fire, the gunner selects a series of successive aiming points on the target and fires a succession of aimed bursts. Swinging traverse fire does not apply to the bipod mounted gun; free gun fire with the bipod machinegun is delivered from the assault fire positions.

TACTICAL EMPLOYMENT

Offensive Operations. The rifle platoon leader has three general alternatives when employing his two machineguns in the attack.

a. Both guns can be left on or in the vicinity of the line of departure to deliver supporting fire when the objective is in range and sight from the line of departure and the route of advancing troops is unobscured.

b. One gun can be left on or in the vicinity of the line of departure and one taken with the advancing troops when the objective is in range and sight from the line of departure, but a part of the route is obscured.

c. Both guns can be taken with the attacking element when the objective is not in range and/or sight from the line of departure and the route is obscured.

Note. These three alternatives may, of course, be influenced by the amount of other supporting fire available.

Defensive Operations. The defensive machinegun positions are located to cover likely avenues of enemy foot approach. Final decision is based on the best observation and fields of fire, available cover and concealment, obstacles, and how well each location would protect key terrain. Mutual support between automatic weapons, including those of adjacent units, is accomplished to the maximum extent.

MARKSMANSHIP

During a gunner's training with the M60 machinegun, he fires on five different range complexes. These ranges are the basic (10-meter) range, transition range, day defensive field firing range, predetermined fire field firing range, and assault fire range.

THE 106–MM RECOILLESS RIFLE, M40A2

GENERAL

The 106-mm rifle is a lightweight recoilless weapon intended for use in both antitank and antipersonnel roles. It is an air-cooled, breech-loaded, single-shot rifle that fires fixed ammunition. The rifle is equipped with a manually operated breech mechanism and a percussion-type firing mechanism.

Standard mount for the rifle is the M79 which serves both to attach the rifle to the ¼-ton carrier and to support the rifle when employed off the vehicle in its ground-mounted role (fig. 82).

Tabulated Data.

106-mm rifle with sight brackets, cables, sight mount M90, sight cover, and transfer box	251 pounds.
Gun, caliber .50	25 pounds.
Magazine, caliber .50 (empty)	1 pound.
Mount M79	180 pounds.
Sight M92D and night sight device (with batteries)	3 pounds.
Total	460 pounds.
Overall length	134 inches.
Height on M79 mount	44 inches.

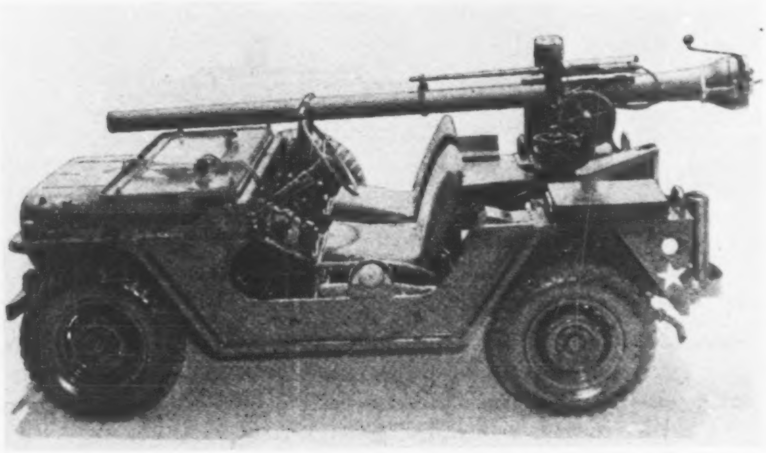


Figure 82. The 106-mm recoilless rifle (M151A1C) mounted on ¼-ton carrier.

Width:	
(Legs spread)	60 inches.
(Legs closed)	31.5 inches.
Length of bore	107.5 inches.
Type of breechblock	Interrupted thread.
Maximum range	7,700 meters.
Maximum effective range	1,100 meters.

NOMENCLATURE

Barrel Assembly. The barrel assembly consists of a tube, an enlarged reaction chamber, and a mounting bracket. The tube is made of alloy steel, threaded at the rear to receive the reaction chamber. The breech end of the chamber is threaded to receive the vent bushing. Holes are provided on the left side of the chamber at the breech end to receive screws that secure the hinge block and lock the vent bushing in place. On the right side are holes for screws that fasten the trigger housing to the chamber. One screw also secures the vent bushing. The carrying handle bracket is tightly fitted and keyed to the barrel. A lanyard rod is provided at the front of the trigger housing for emergency firing when the firing cable or mechanism is damaged.

Breech Mechanism. The breech mechanism consists of a vent bushing, breechblock, breechblock hinge, and a breech operating group.

Firing Mechanism. Portions of the firing mechanism are found in the breechblock, trigger block and firing cable, and mount M79.

Mount M79. The mount M79 (fig. 84), is designed specifically to accommodate the 106-mm rifle. The mount is basically a tripod. The two rear legs have carrying handles and catches and the front leg has a hard

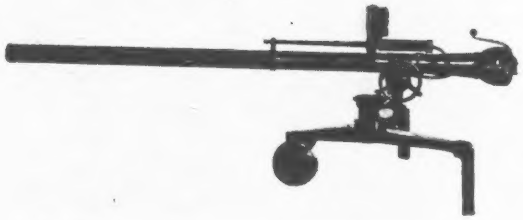


Figure 83. The 106-mm rifle on the M79 mount.

rubber wheel. The tripod also includes elevating and traversing mechanisms and a portion of the firing mechanism. The mount provides a stable base for using the rifle on the ground and also provides a means of attaching the rifle to modified ¼-ton carriers.

Caliber .50 Spotting Gun. The spotting gun is gas-operated, magazine-fed, and semiautomatic. It is designed to assist the gunner in determining range and leads to the target. The gun fires special caliber .50 spotting ammunition.

Direct Fire Sight—Elbow Telescope M92D. The M92F elbow telescope has a fixed focus, three-power magnification, and a field of view of 12 degrees, 12 minutes.

The reticle pattern is a series of broken horizontal lines and a broken vertical line. At the top of the pattern is a crosshair representing zero deflection and zero range. This is the boresight cross. Each vertical line segment and each space between vertical line segments represents 100 meters of range. Each horizontal line segment and each space between horizontal line segments represent an angular lead of 5 mils. equal to 5 miles per hour.

The curved stadia lines are an aid in estimating range. The center point of the small circles within the reticle pattern represent the ends of lead lines that are eliminated to insure a clear field of view through the reticle.

Subcaliber Device. The subcaliber device for the 106-mm rifle provides the gunner and loader training without using expensive service ammunition.

Blackblast. The 106-mm rifle has a blackblast area extending 39 meters to the rear of the breech. Prior to firing, this area must be cleared of personnel and equipment.

AMMUNITION

Ammunition for the 106-mm rifle is issued in complete, fixed cartridges. The term "fixed" means that the projectile and the cartridge case are crimped together. This insures correct alinement of the projectile and the cartridge case. It also permits faster loading because the projectile and the cartridge case are loaded as one unit.

There are four types of ammunition for the 106-mm recoilless rifle; the high explosive antitank (HEAT), High Explosive Plastic with tracer (HEP–T), Antipersonnel with tracer (APERS–T) and the caliber .50 spotter tracer. The HEAT and HEP–T projectiles contain high explosive and are painted olive drab with yellow markings. The APERS–T round is painted olive drab with white marking and white diamonds. These identifying markings are repeated on the sealing tape around the fiberboard container.

High Explosive, Antitank, M344A1. The high explosive antitank cartridge employs the shaped charge principle to defeat armor. It does not depend upon velocity at the moment of impact for its effect. It relies upon a concentration of the effect of the explosive filler through its shape. The conical shape of the filler concentrates the force of the explosion into a hot jet that blows its way through the armor. The conical shape of the filler is maintained by a metal cone which forms a slug when the filler is exploded. This slug of metal may or may not follow the explosive jet through the armor. The complete cartridge weighs 37 pounds. The projectile weighs approximately 17 pounds, has a muzzle velocity of 1,650 feet per second, and a maximum range of 7,700 meters.

For maximum effect, the shaped filler must be at exactly the right distance from the face of the armor when it detonates. This distance is called "stand-off." Stand-off is provided by the ogive, or ballistic windshield, on the nose of the projectile.

HEP–T–M346. The high explosive plastic cartridge, with tracer, uses a comparatively new principle to defeat armor. Detonation of the explosive charges sets up shock waves that cause a "spalling" or chipping of the interior tank surface. It is completely effective without necessarily penetrating the exterior surface. The projectile achieves maximum efficiency against sloping armor rather than vertical armor. Because of its characteristic plastic filler, this projectile has a tendency to spread out over the target surface on impact. It is very effective against concrete, timber or log barricades, and bunkers. Its fragmentation makes it an excellent antipersonnel projectile. The projectile is equipped with a base detonating fuze which contains a tracer element. It weighs 17 pounds and has a muzzle velocity of approximately 1,650 feet per second. The complete cartridge weighs 37 pounds, and has a maximum range of 7,700 meters.

APERS–T–M581. The antipersonnel with tracer round contains 9,000 eight-grain steel flechettes (fin stabilized fragments of eight-grain steel wire). Located on the nose of the projectile is a mechanical time fuze which can be set for muzzle action or for ranges from 200 to 3,300 meters. When the fuze functions the flechettes are dispersed in an eighteen degree cone and travel an additional 300 meters from the point of fuze functioning. A yellow dye marker is released at the point of fuze functioning to mark the point of fuze functioning.

Spotter-Tracer Cartridge, Caliber .50, M48. The spotting gun employs a spotter-tracer cartridge. The projectile contains a tracer element and a white phosphorous filler. On impact, the white phosphorous produces a puff of white smoke, which aids in adjusting fire. Tracer burnout point is between 1,500 and 1,600 meters. The cartridge can be identified by the red and yellow markings on the nose of the projectile. Handle spotter-tracer ammunition with care because it is neither drop safe nor bore safe. A sharp blow may shatter the nose, igniting the spotter element and causing injury to personnel or damage to equipment. The spotter-tracer cartridge is designed so that its trajectory closely matches the trajectory of 106-mm service ammunition. Its muzzle velocity is 1,750 feet per second, and maximum range 3,100 meters. Never use ammunition other than spotter-tracer in the spotting gun.

THE 90-MM RECOILLESS RIFLE, M67

GENERAL

The 90-mm rifle is an air-cooled, single-shot, breech-loaded, lightweight recoilless weapon that can be fired from the shoulder or from the ground. The weapon is a direct fire antitank weapon and fires fixed ammunition (fig. 84). It replaces the 3.5-inch rocket launcher in the weapon squads of rifle platoons.

Tabulated Data.

Weight	35 pounds.
Length	53 inches.
Height, ground mounted	17 inches.
Muzzle velocity	700 feet per second.
Maximum range	2,100 meters (approximate).
Maximum effective range	400 meters (approximate).

AMMUNITION

Presently there are three types of ammunition available for the 90-mm recoilless rifle; HEAT M371E1, TP M371, and 90-mm canister XM590E1. The high explosive antitank round uses the shaped charge principle to defeat armor. The target practice round is not standard but is available for issue in certain areas. It is ballistically identical to the HEAT round but contains only a small spotting charge as the projectile filler. The 90-mm canister round XM590E1,

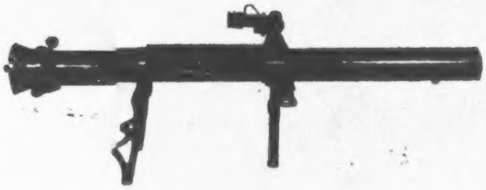


Figure 84. Right side view, 90-mm recoilless rifle M67.

is a fixed type antipersonnel round which functions at muzzle action. It defeats personnel by releasing over 2,000 eight grain steel flechettes in an eight degree cone. All three rounds have a cartridge case with a frangible base. When the round is fired the frangible base is broken into small particles which are blown through the openings in the breechblock with a portion of the propelling gases, thus achieving the recoilless action (fig. 85).

Tabulated Data.

Weight of HEAT and TP round	9.25 pounds.
Weight of HEAT and TP projectile	6.75 pounds.
Muzzle velocity of HEAT and TP projectile	700 feet per second.
Weight of APERS round	6.79 pounds.
Weight of APERS projectile	3.97 pounds.
Muzzle velocity of APERS round	1,250 feet per second.

DESCRIPTION

Rifle. The 90-mm recoilless rifle consists basically of the following components:

A steel alloy tube.
A breechblock.

A hinge block which contains the safety that automatically positions itself to the SAFE position when the breechblock is opened.

Bipod legs and a monopad.
A firing handle.
A firing cable and a face shield.
A sight and an instrument light.

Sight. The M103 sight is a 3-power fixed focus sight graduated from 0 to 800 meters (fig. 86). Stadia lines, lead lines, and a range line are etched on the sight reticle. Stadia lines are used to estimate range to targets with dimensions of 10 feet by 20 feet. Each line or space of the range line represents 50 meters of range. Each line or space of the lead line represents one lead or 2½ miles per hour of apparent speed.

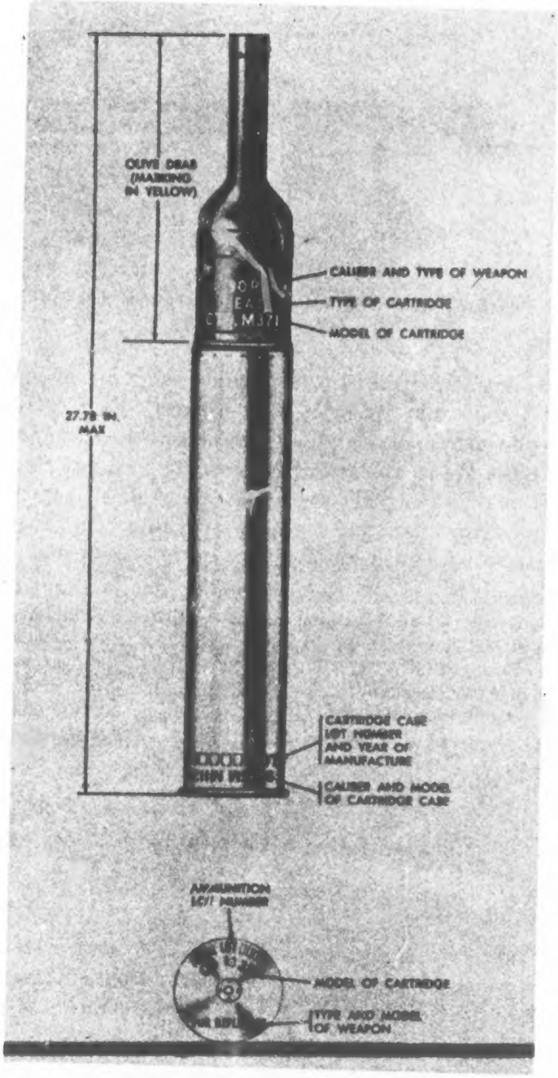

OLIVE DRAB (MARKING IN YELLOW)
CALIBER AND TYPE OF WEAPON
TYPE OF CARTRIDGE
MODEL OF CARTRIDGE
27.78 IN. MAX
CARTRIDGE CASE LOT NUMBER AND YEAR OF MANUFACTURE
CALIBER AND MODEL OF CARTRIDGE CASE
AMMUNITION LOT NUMBER
MODEL OF CARTRIDGE
TYPE AND MODEL OF WEAPON

Figure 85. Cartridge, 90-mm HEAT M371E1.

FUNCTIONING AND POSITIONS

When the loader opens and closes the breech the weapon is cocked. The final phase of functioning is the firing of the weapon.

The 90-mm recoilless rifle is fired from the standing, kneeling, sitting, prone, and foxhole supported positions. The kneeling position is

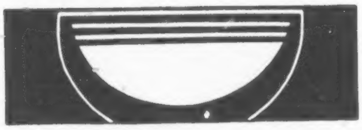


Figure 86. Sight reticle, M103 sight.

the primary position for a moving target. The prone position is the primary position for a stationary target. The other three positions are used as necessity dictates.

81-MM MORTAR, M29

DESCRIPTION

General. The 81-mm mortar (fig. 88) is a smooth bore, muzzle loading, high angle-of-fire weapon that is capable of delivering a heavy volume of fire with a high degree of accuracy out to ranges in excess of 4,700 meters. The mortar consists of three main units: the barrel, the mount, and the base plate. The circular base plate allows the mortar to be shifted in a complete circle (without moving the base plate) by simply moving the bipod.

Tabulated Data.

Weights:	
Mortar, complete	93.5 pounds.
Barrel	28 pounds.
Mount	40 pounds.
Base plate	25 pounds.
Dimensions:	
Overall length	51 inches.
Maximum width	21 inches.
Overall height on bipod	37.5 inches.
Diameter of base plate	21 inches.

EMPLOYMENT

An 81-mm mortar platoon consists of three squads, and is organic to the infantry rifle company. Normally, the three mortars are employed in support of the rifle company mission.

Since the mortar is an indirect fire weapon, it is normally fired from a defilade position and the mortar crew cannot see the target. Information on targets is formulated by a forward observer, who relays the information in the form of a *call for fire* to the fire direction center. Here, computers, using a device called the M16 plotting board, convert the target information into firing data which is then transmitted to the mortars in the form of a *fire command*. After the initial round lands, the forward observer sends back corrections which are again

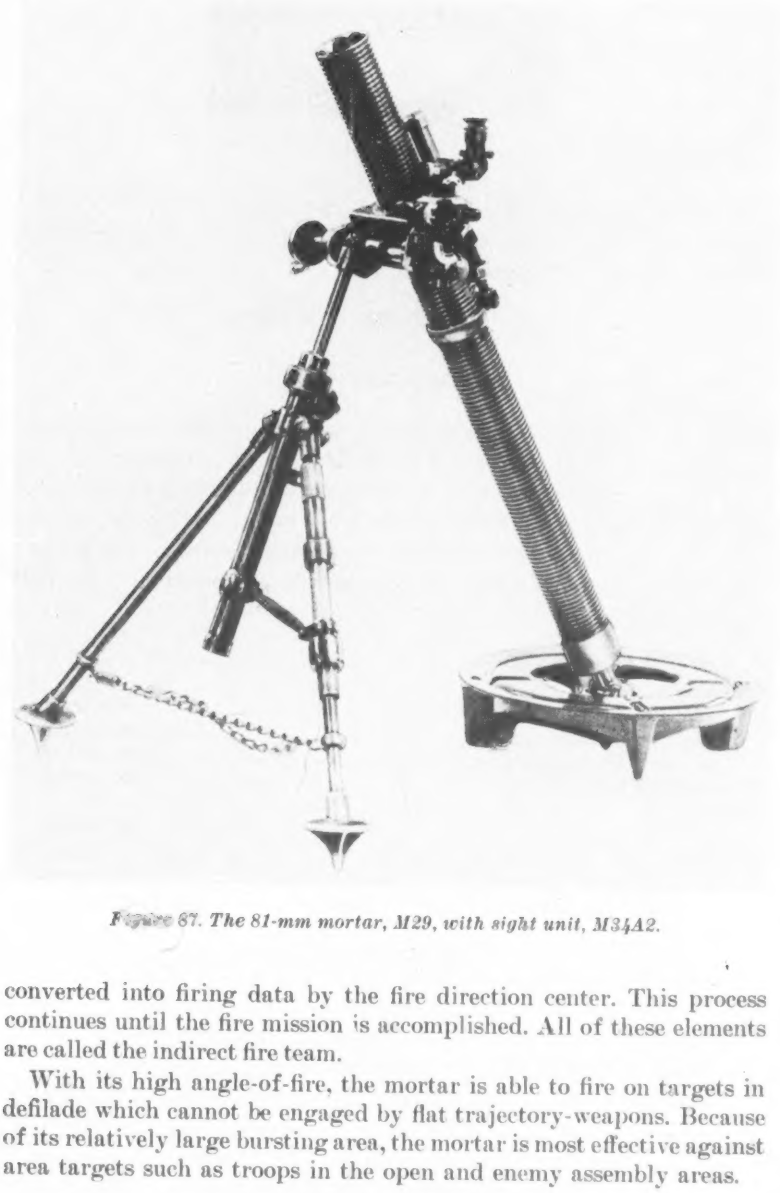


Figure 87. The 81-mm mortar, M29, with sight unit, M34A2.

converted into firing data by the fire direction center. This process continues until the fire mission is accomplished. All of these elements are called the indirect fire team.

With its high angle-of-fire, the mortar is able to fire on targets in defilade which cannot be engaged by flat trajectory-weapons. Because of its relatively large bursting area, the mortar is most effective against area targets such as troops in the open and enemy assembly areas.

FUNCTIONING

The mortar is fired by inserting a round, fin assembly down, into the muzzle. The angle of the barrel causes the round to slide downward.

When it reaches the base, the primer of the ignition cartridge strikes the firing pin. The explosion of the primer sets off the ignition cartridge which ignites the propellent increments. Gas produced by the burning increments drives the round up and out of the barrel. A safety device on the round prevents it from becoming armed before it leaves the muzzle.

81-MM MORTAR AMMUNITION

This chart reflects basic data on the standard ammunition for the 81-mm mortar (fig. 89).

Cartridge	Range (Meters)	Weight (Pounds)	Color Code Markings on Rounds	Primary Use
HE, M374 A2	4737	9. 34	Olive Drab w/Yellow Markings	Antipersonnel
HE, M362	3550	9. 42	Olive Drab w/Yellow Markings	Antipersonnel
WP, M375 A2	4737	9. 34	Light Green w/Red Markings	Smoke
WP, M370	3618	9. 34	Light Green w/Red Markings	Smoke
Illuminating M301A3	3150 (to burst)	10. 2	White w/Black Markings	Illumination
Illuminating M301A1	2150	10. 71	White w/Black Markings	Illumination
Practice M43A1.	3522	7. 15	Blue w/White Markings	Training

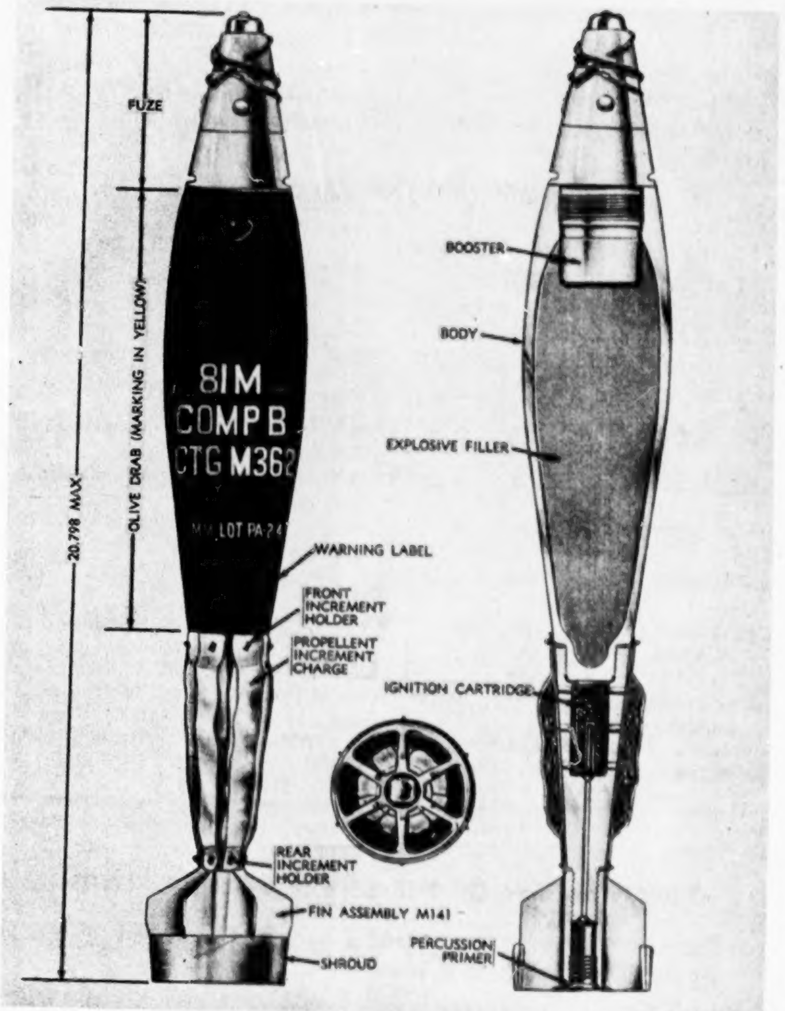
ORGANIZATION OF THE 81-MM MORTAR PLATOON

The mortar platoon is commanded by a lieutenant and the platoon is divided into the three elements:

Mortar Squads. The mortar squads consist of five men: squad leader, gunner, assistant gunner, ammunition bearer, and driver and/or ammunition bearer. There are three identical squads in the mortar platoon.

Forward Observer Teams. There are three identical forward observer teams in the mortar section. Each team consists of an NCO forward observer and his radiotelephone operator. Each team normally operates with a rifle platoon.

Fire Direction Center. The fire direction center consists of two computers and the necessary equipment to control the fires of the section.


FUZE
OLIVE DRAB (MARKING IN YELLOW)
20.798 MAX
81M
COMP B
CTG M362
M.V. LOT PA-24
WARNING LABEL
FRONT INCREMENT HOLDER
PROPELLENT INCREMENT CHARGE
REAR INCREMENT HOLDER
FIN ASSEMBLY M141
SHROUD
BOOSTER
BODY
EXPLOSIVE FILLER
IGNITION CARTRIDGE
PERCUSSION PRIMER

RA PD 253471A

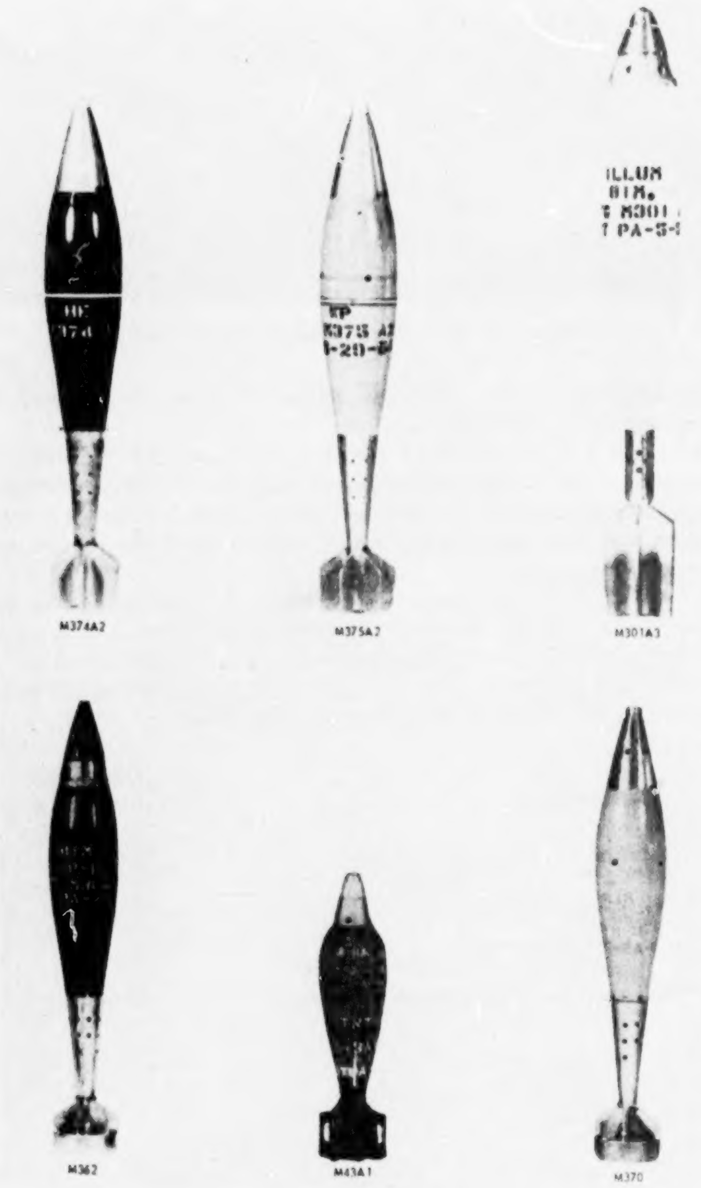
1 Cutaway showing components

Figure 88. 81-mm mortar ammunition.

105-MM HOWITZER, M102

GENERAL

Artillery provides an effective means of long range, indirect fire support in all type weather. The M102 (fig. 89) is an example of the


M374A2
M375A2
M301A3
M362
M43A1
M370

2 Types of 81-mm rounds

Figure 88—Continued.

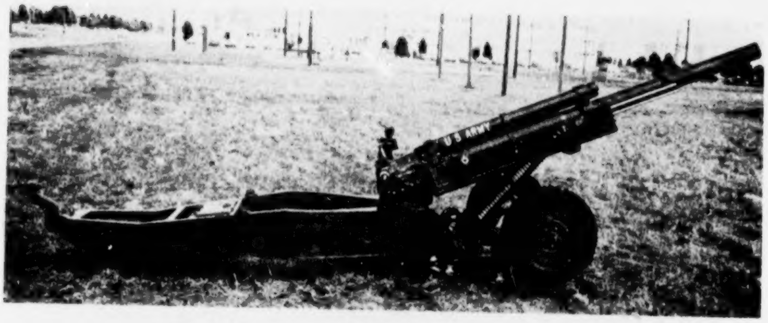


Figure 89. The 105-mm howitzer, M102, towed.

light artillery howitzer which can deliver fire over a large area without changing emplacement location.

Through a combination of forward observers and fire direction personnel, coordinating information on range and direction of targets, firing data is passed to the howitzer section, which includes a chief, gunner, assistant gunner, cannoneers, and driver of the vehicle used to tow the howitzer.

The **M102** howitzer, being a comparatively light weight, is used primarily in airborne, infantry, and airmobile units. It is designed for quick rotation in any direction and fires a variety of rounds including high explosives that are very effective against troops in the open or emplacements, and against all type vehicles.

Tabulated Data.

Range	**11,500 meters.**
Weight (of howitzer)	**3,017 pounds.**
Rates fire:	
First 3 minutes	**30 rounds.**
Sustained fire, per minute	**3 rounds.**
Prime mover (types):	
Helicopter.	
Parachute (airdrop).	
1¼-ton Truck.	
Effective radius (of shell fragments) at point of burst	**175 meters.**

CHAPTER 21

ANTIPERSONNEL/TANK MINES

GENERAL

A mine is an explosive or other material, normally encased, designed to destroy or to damage vehicles, boats, or aircraft, or designed to wound, kill, or otherwise incapacitate personnel. It may be detonated by target contact, magnetic influence, wire or radio control, or by a preset timer.

Mines, employed to create a minefield, are among the best artificial obstacles; they are portable, installed relatively easy, and constitute a hazard to the enemy.

Whenever possible, minefields are covered by fire and observation. Minefields should also be tied in with other natural or manmade obstacles.

ANTIPERSONNEL MINE, M18A1

GENERAL

The "Claymore" M18A1 mine is a one-shot directional-fragmentation mine that is designed for use in the defensive and offensive role against personnel. It consists of a plastic body, a fixed plastic sight, four adjustable legs, and two fuze wells. The front portion of the plastic case is a fragmentation face containing steel fragments. The back portion of the case contains a layer of explosive.

ACCESSORIES

The M18A1 and all accessories (fig. 90) are carried in the M7 bandoleer. The accessories include—

Instruction Sheet. Sketches and printed matter on this sheet show some of the techniques of employment of the weapon.

Detonator. One M6 electric blasting cap which is attached to 100 feet of firing wire.

Firing Device. The firing device M57 is a hand-held pulse generator which, by a single actuation of the handle, produces a double (one positive and one negative) electrical pulse.

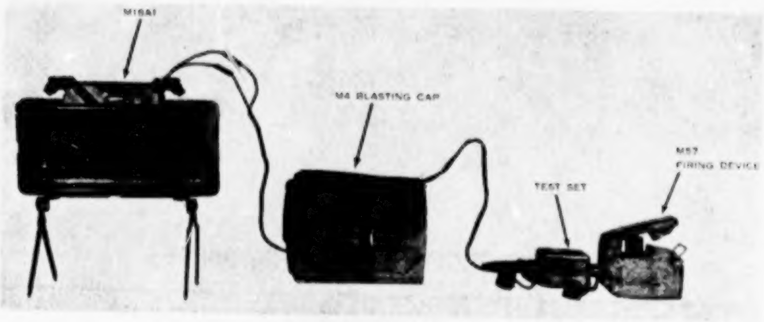


Figure 90. M18A1 with accessories.

EFFECTS OF THE WEAPON

Casualty Effects. When detonated, the M18A1 delivers highly effective fragments in a fan-shaped pattern approximately 2 meters high and 50 meters wide at a range of 50 meters (fig. 91). This makes 50 meters the optimum effective range of the mine. The fragments are moderately effective up to a range of 100 meters and can travel up to 250 meters forward of the mine.

Danger from Backblast. The minimum safe firing distance from the mine is 16 meters.

From 16 to 100 meters, the operator should be in a foxhole or lie prone (preferably in a depression behind protection regardless of how the weapon is employed).

INSTALLATION OF THE CLAYMORE

The M18A1 may be installed as a controlled or as an uncontrolled mine (figs. 92, 93, 95, and 96). It may be mounted on a tree, a building, or on any similar object. However, it must be taken into consideration that damage to these objects will result from the backblast of the mine after it has been fired.

To install the M18A1 as a controlled mine, follow the procedures listed below.

a. Remove the mine from the bandoleer and turn the legs first to the rear, then downward. Spread both pairs of legs to an angle of about 45° so that one leg of each pair protrudes to the front and one to the rear of the mine. Position the mine, with the legs half way into the ground, so that the surface marked "Front Toward Enemy" and the arrows on top of the case point in the desired direction of fire.

b. Select an aiming point 50 meters forward of the mine and on the ground (fig. 94). Position the eye approximately 6 inches behind the mine's knife-edge sight and aim it by aiming the rear sight blade

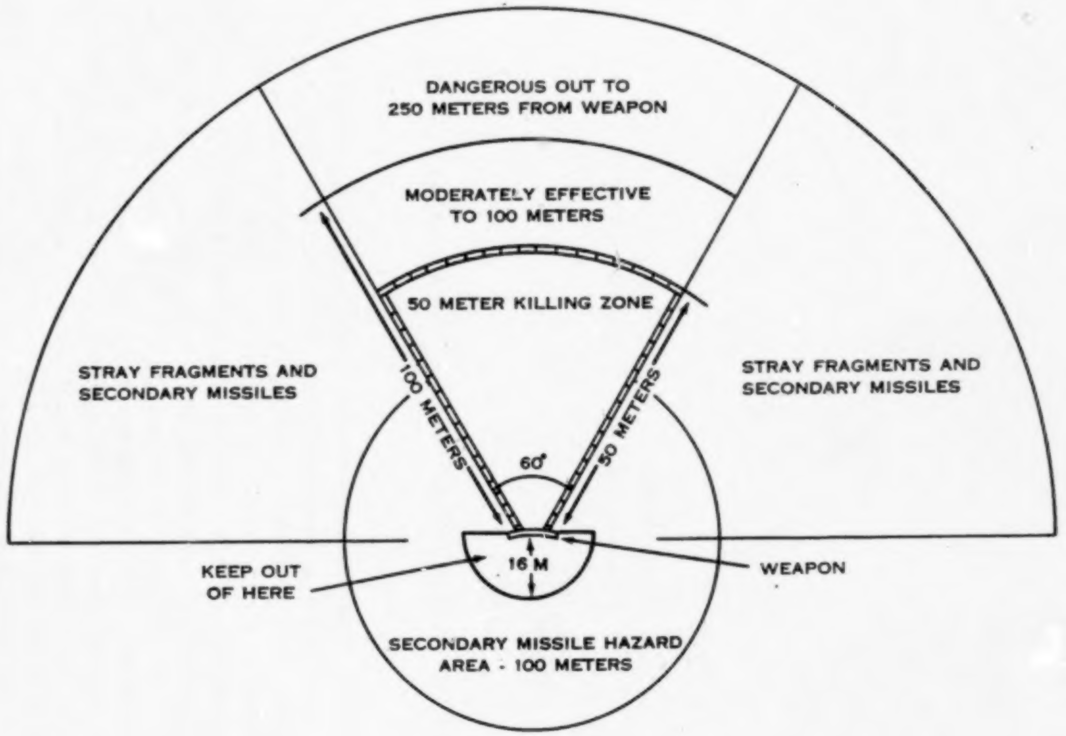

DANGEROUS OUT TO
250 METERS FROM WEAPON
MODERATELY EFFECTIVE
TO 100 METERS
50 METER KILLING ZONE
STRAY FRAGMENTS AND
SECONDARY MISSILES
STRAY FRAGMENTS AND
SECONDARY MISSILES
100 METERS
50 METERS
60°
16 M
KEEP OUT
OF HERE
WEAPON
SECONDARY MISSILE HAZARD
AREA - 100 METERS

Figure 91. Danger radius and effects of the M18A1.

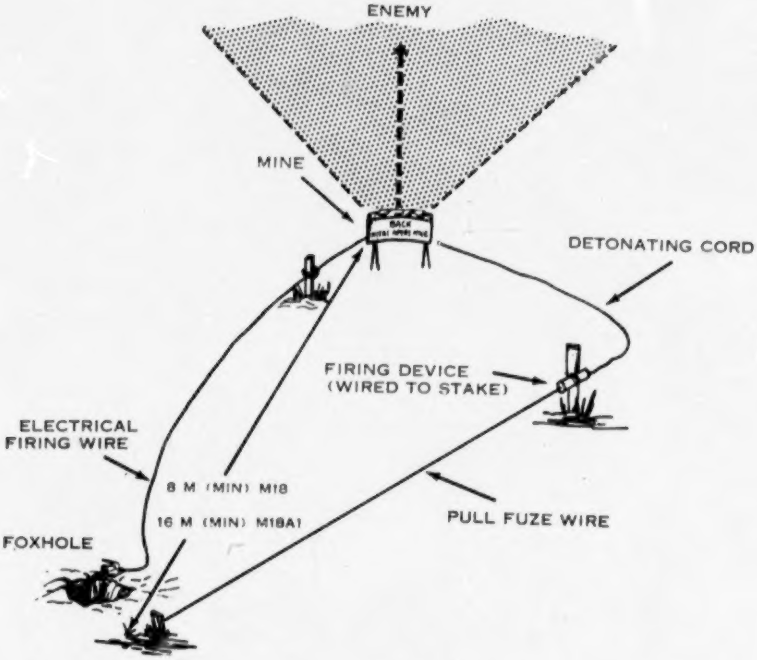


Figure 92. Diagram showing mine installed for nonelectrical and electrical detonations.

with the front sight blade and the aiming point. In the case of a mine with the "slit-type peepsight," select an aiming point that is 50 meters forward of the mine and 2½ meters off the ground (i.e., tree, bush, etc.). Again position the eye 6 inches behind the mine and sight through the slit-type peepsight. The groove of the sight should be in line with the aiming point. The aiming point should be the lateral center of the desired area of coverage, and the bottom edge of the peepsight should be parallel with the ground that is to be covered.

c. Prior to inserting the blasting cap into the fuze well, secure the firing wire to a stake driven into the ground near the mine. This will minimize accidental disturbance of the aim while laying out the firing wire. The wire should be buried to protect it and to prevent detection.

d. Time permitting, conduct a circuit test. After testing, connect the blasting cap assembly to the firing device. The mine is now armed.

When M18A1s Claymores are employed as uncontrolled mines, they are treated as mines or boobytraps. Their locations are marked, reported, and recorded. They must be retrieved after the operation to preclude harming friendly personnel.

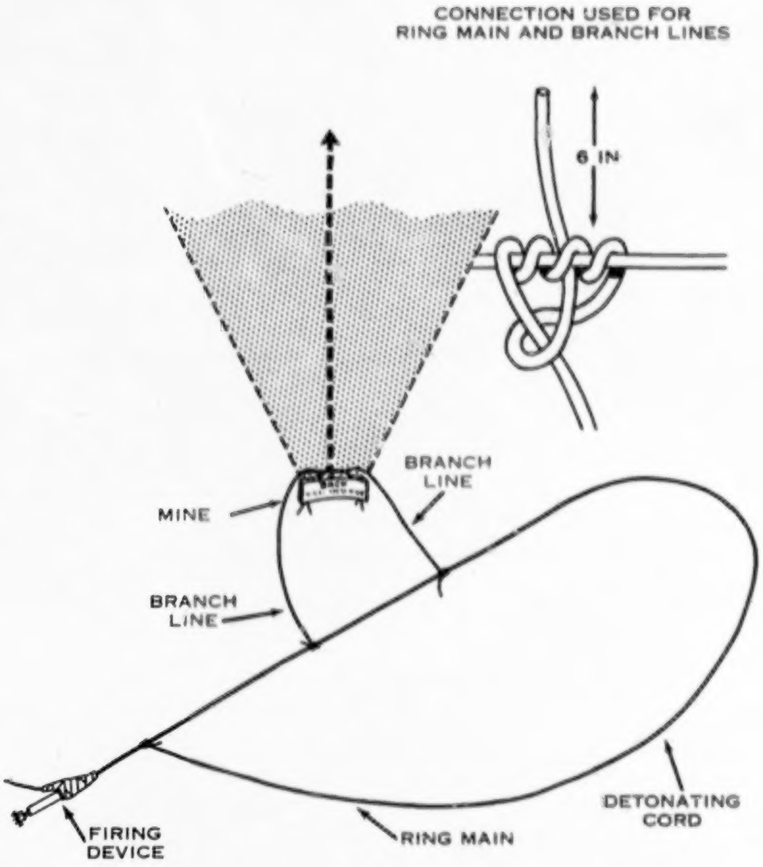

CONNECTION USED FOR
RING MAIN AND BRANCH LINES
6 IN
BRANCH
LINE
MINE
BRANCH
LINE
FIRING
DEVICE
RING MAIN
DETONATING
CORD

Figure 93. Diagram showing mine with M3 pull release-type firing device.

ANTIPERSONNEL MINES: M14, M16A1

There are two additional types of antipersonnel mines designed for use against enemy personnel. They are the—

Blast-type antipersonnel mines which result in a concussion or blast created by the explosion. The mine functions without delay while still in contact with the individual who has activated it. The M14 is a nonmetallic antipersonnel blast mine. The mine weighs 3¼ ounces. It is designed to inflict an incapacitating wound on the individual who activates it (fig. 97).

Fragmentation-type antipersonnel fragmentation mines which have a capability to cover a fairly wide area with high-velocity fragments to wound or kill enemy personnel. The M16A1 antipersonnel mine is

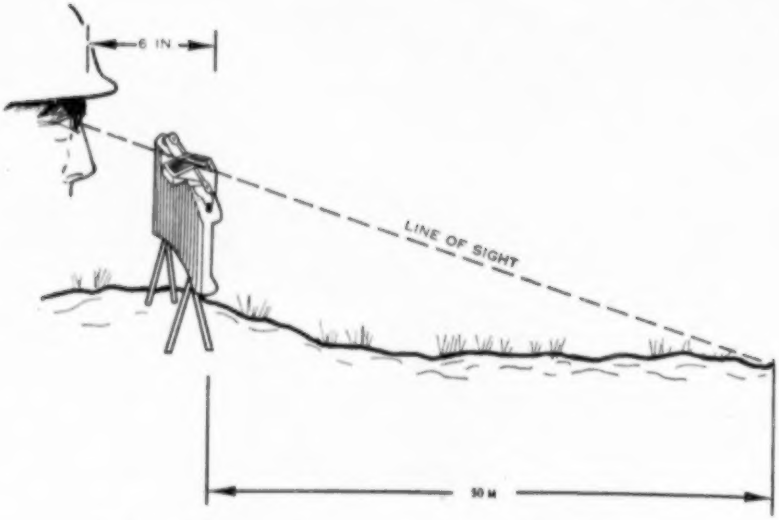

6 IN
LINE OF SIGHT
50 M

Figure 94. Aiming the M18A1 with the knife-edged sight.

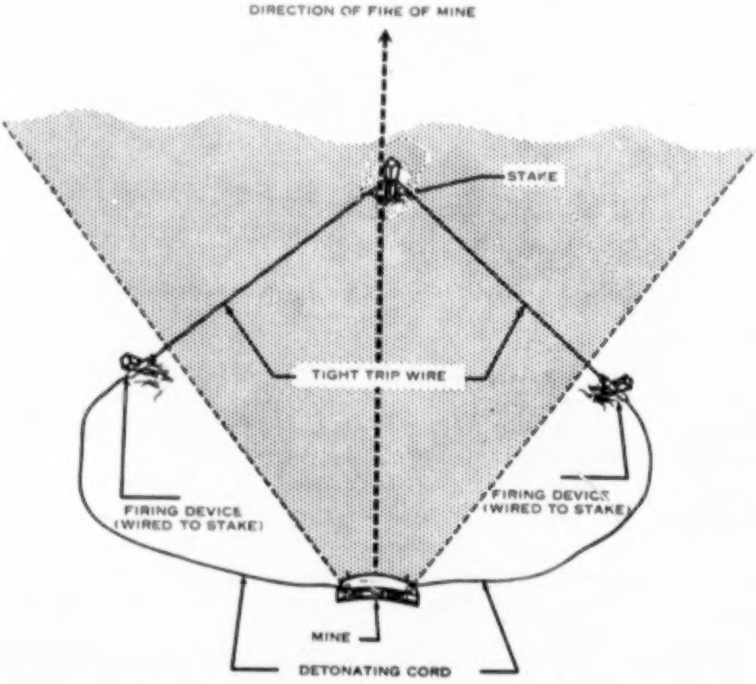
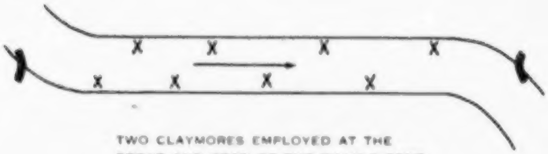
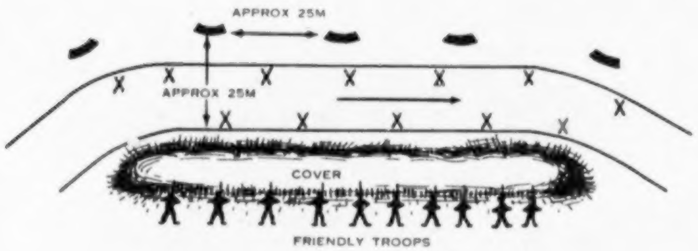

DIRECTION OF FIRE OF MINE
STAKE
TIGHT TRIP WIRE
FIRING DEVICE (WIRED TO STAKE)
FIRING DEVICE (WIRED TO STAKE)
MINE
DETONATING CORD

Figure 95. Diagram showing installation as a mine, using two tight tripwires and two M3 pull release-type firing devices.



TWO CLAYMORES EMPLOYED AT THE FRONT AND REAR OF THE KILLING ZONE



CLAYMORES EMPLOYED LATERALLY ALONG THE KILLING ZONE

Figure 96. Diagram showing mine employed in ambush.

a fragmentation mine. This mine weighs approximately 8 pounds and may be employed for pressure activation or pressure tripwire activation. The M16A1 has an effective casualty radius of 30 meters and a danger radius of 200 meters (fig. 98).

These mines are buried just below the surface of the ground in contrast to the "Claymore" mine which is placed above ground.

ANTITANK MINES: M15, M19, M21, M24

Antitank mines are used to destroy or immobilize enemy tanks or other vehicles. Examples of antitank mines are as follows:

The M15 antitank mine weighs 30 pounds and contains 21 pounds of composition "B" as an explosive filler. Three hundred or more pounds of pressure on the pressure plate will cause the mine to explode. This mine derives its effectiveness from the blast or concussion caused by the explosion. When it explodes it will break a tank track or vehicle wheel thus immobilizing the tank or vehicle. The M15 is a metallic mine and is easily detected by a metallic mine detector (fig. 99).

The M19 is a nonmetallic antitank mine that weights 28 pounds and contains 21 pounds of composition "B" as an explosive filler. Three

202

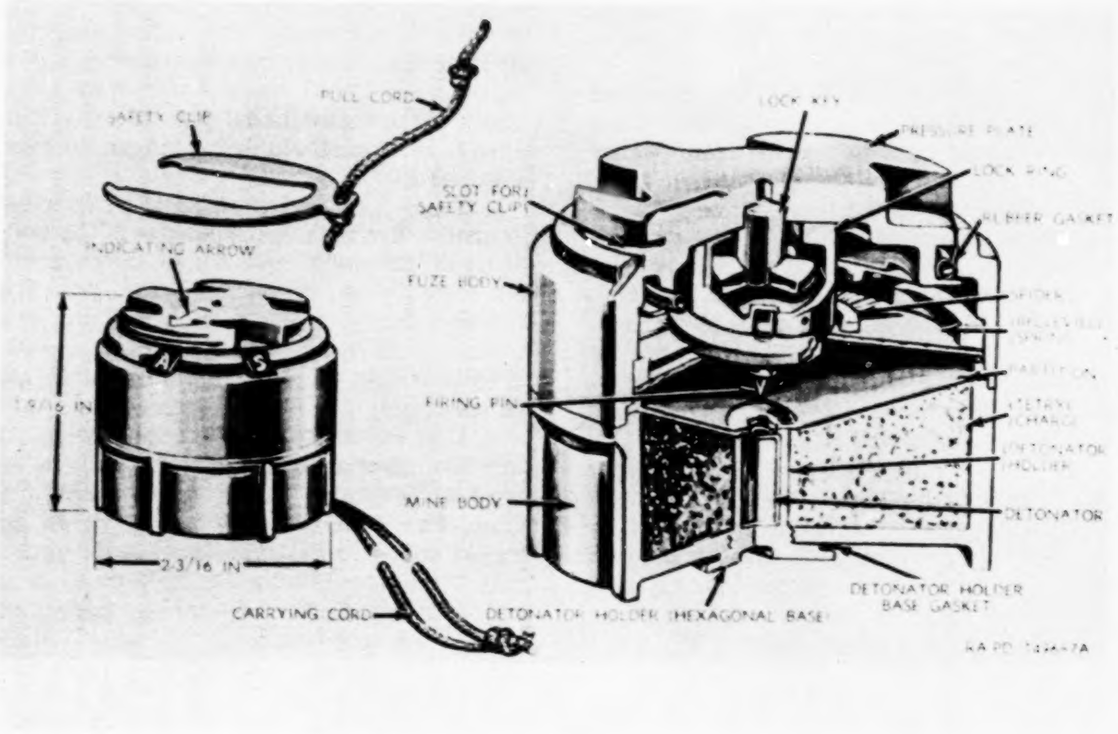

PULL CORD
SAFETY CLIP
INDICATING ARROW
A
S
1-9/16 IN
2-3/16 IN
CARRYING CORD
SLOT FOR SAFETY CLIP
FUZE BODY
FIRING PIN
MINE BODY
DETONATOR HOLDER (HEXAGONAL BASE)
LOCK KEY
PRESSURE PLATE
LOCK RING
RUBBER GASKET
SPIDER
BELLEVILLE SPRING
PARTITION
TETRYL CHARGE
DETONATOR HOLDER
DETONATOR
DETONATOR HOLDER BASE GASKET
RA PD

Figure 97. The M14 blast mine.

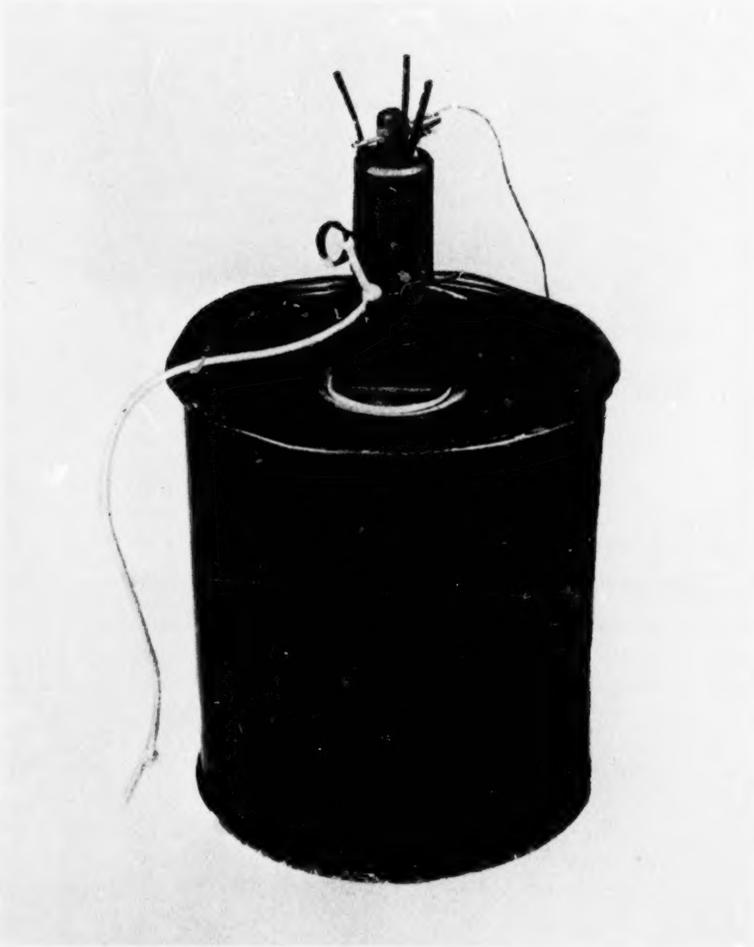


Figure 98. The M16A1 fragmentation mine.

hundred fifty or more pounds of pressure on the pressure plate will cause the mine to explode. Its effectiveness is also derived from the concussion or blast created by the explosion. This mine, as the M15, is capable of immobilizing any known armor or vehicle on the battlefield (fig. 100).

The M21 antitank mine weighs approximately 18 pounds. It has the capability of destroying a tank or other vehicle by propelling a steel plate through the bottom of the vehicle (fig. 101).

The M24 off-route mine also has the capability of destroying any known armor on the battlefield today through the use of an M28A2

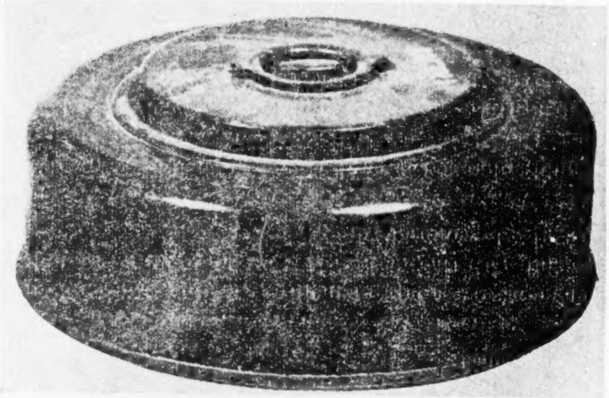


Figure 99. The M15 antitank mine.

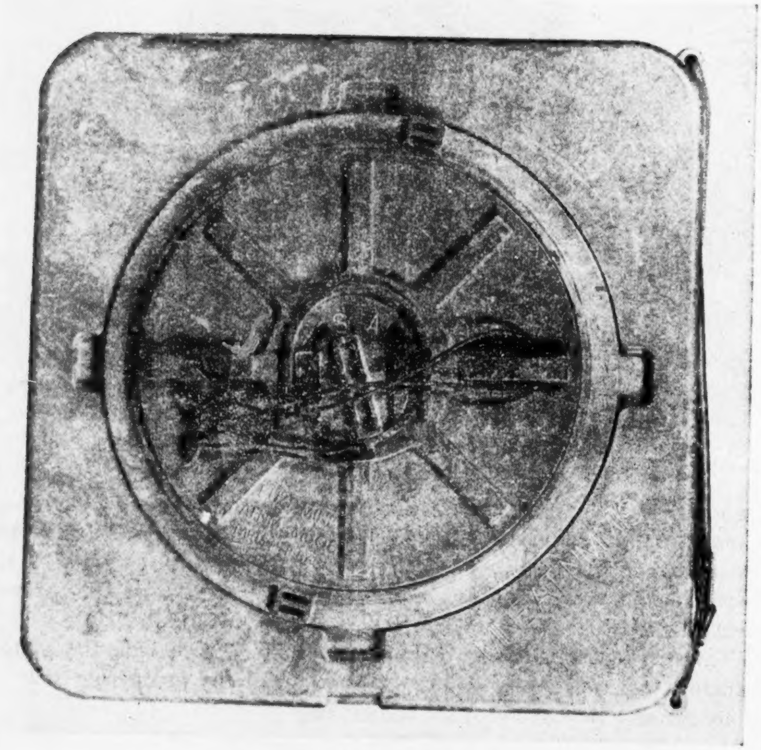


Figure 100. The M19 antitank mine.

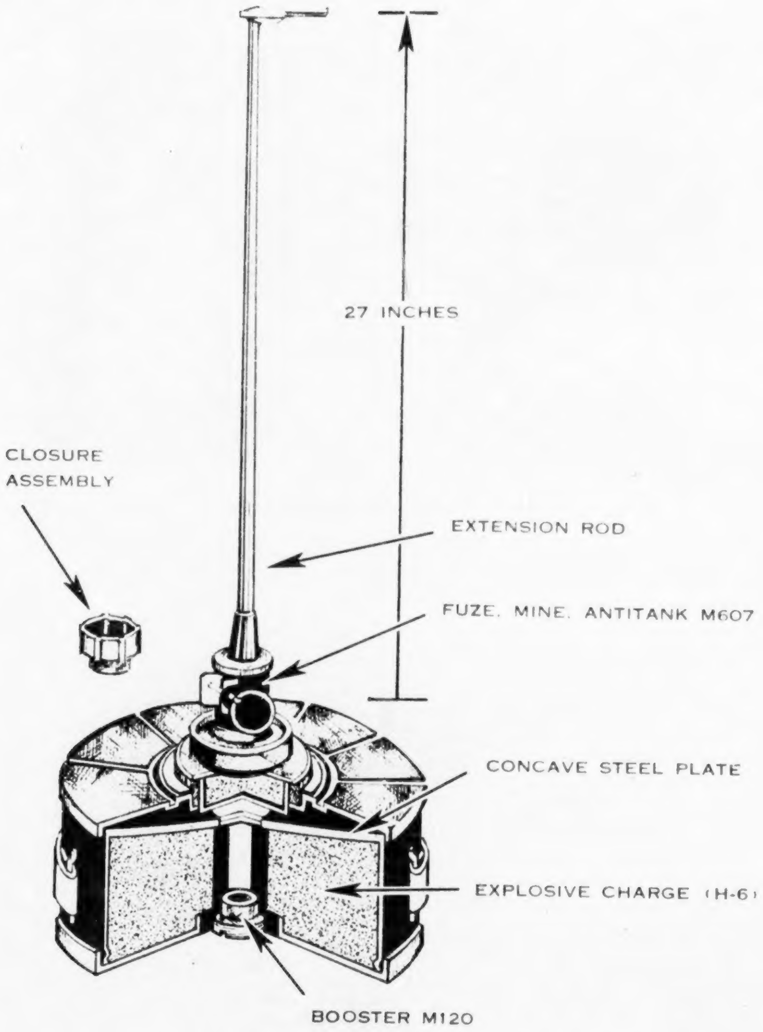

27 INCHES
CLOSURE ASSEMBLY
EXTENSION ROD
FUZE, MINE, ANTITANK M607
CONCAVE STEEL PLATE
EXPLOSIVE CHARGE (H-6)
BOOSTER M120

Figure 101. The M21 antitank mine.

rocket (a modified 3.5-inch rocket). When a vehicle crosses a linear tape switch the firing chain is initiated and a rocket is launched at the vehicle (figs. 102, 103).

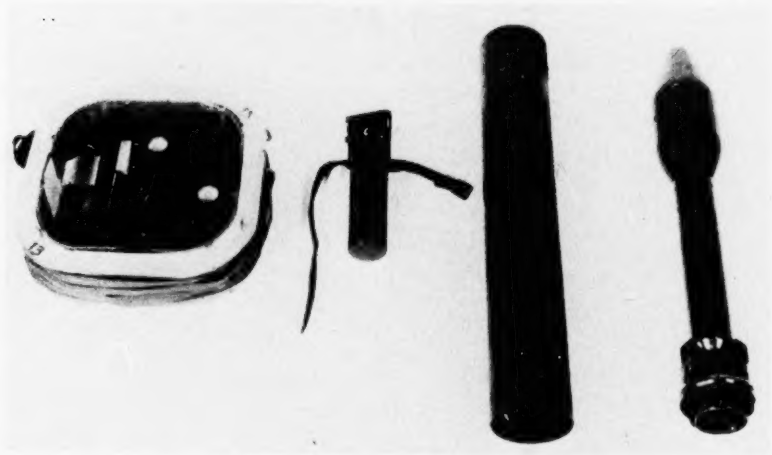


Figure 102. The M24 antitank mine.

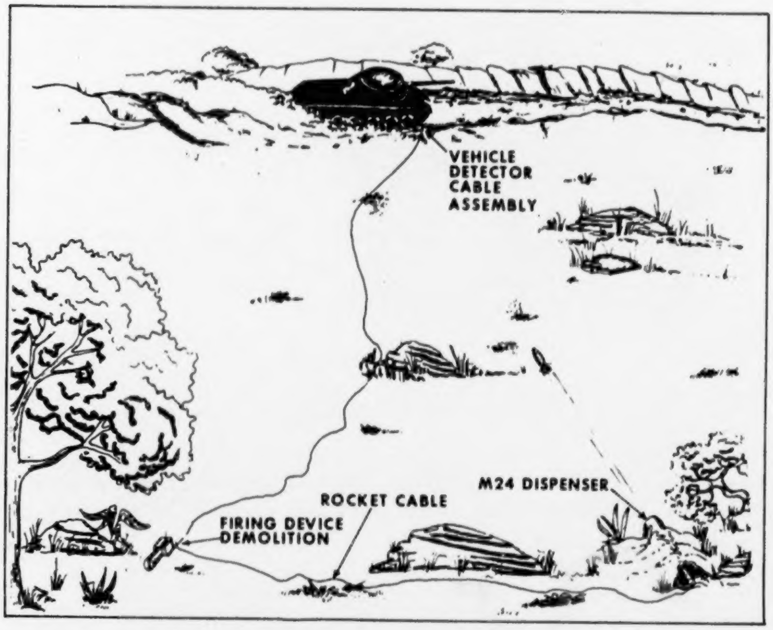

VEHICLE DETECTOR CABLE ASSEMBLY
M24 DISPENSER
ROCKET CABLE
FIRING DEVICE DEMOLITION

Figure 103. Diagram showing employment of the M24 mine.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

- HQDA (DAPE) (2)
- HQDA (DALO) (2)
- HQDA (DARC) (2)
- HQDA (DAMH) (2)
- HQ CONARC (2)
- HQ CONARC ROTC Dir (15)
- CONUSA (5)
- USARAL (5)
- USARHAW (5)
- USARSO (5)
- USMA (2)
- SVC COLL (2)
- USAADS (2)
- USAAGS (2)
- USAFAS (2)
- USAARMS (2)
- USACAS (2)
- USACMLCS (2)
- USAAVNS (2)
- USAES (2)
- USAFS (2)
- USAINTS (2)
- USAIS (4)
- USAMPS (2)
- USAOC&S (2)
- USASCS (2)
- USASESCS (2)
- USAIMA (2)
- USATSCH (2)
- MFSS (2)
- TJAGSA (2)
- JR ROTC/NDCC Units

NG and USAR: None.

For explanation of abbreviations used, see AR 310–50.

ERIC Clearinghouse
OCT 1 9 1972
on Adult Education

U. S. GOVERNMENT PRINTING OFFICE : 1972 O - 456-127